

M ARTISAN

19th National Oil Heat Exposition

Navy Pier, Chicago, Ill.



• A Show Section previewing the OHI annual convention, Palmer House, Chicago, April 2-6, starts on page 83. A list of exhibitors at the Oil Heat Exposition, Navy Pier, is on page 86.

• Free service on warm air heating installations for one full year helps build business in Denver, Colo.

• Year round air conditioning system installed in Minnesota home provides flexible Indoor Comfort.

• An oil fired winter air conditioning unit with provisions for summer cooling revamps bowling alley.

• For the first installment of a new series of articles on basic sheet metal shop practice turn to page 93.

AIR CONTROL REGISTERS & GRILLES



Everybody Sees This Part of Your Heating Installation

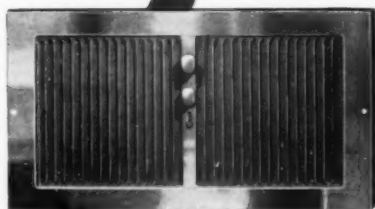
You can't put a better finish to your heating installation than Air Control's Air Conditioning Registers and Grilles.

Your customers will like the smart styling of these Air Control Registers and Grilles. Their recessed face and satin beige color blend pleasingly with any room interior. The adjustable fins, plus adjustable louvers give you four-way control of the air. This complete control of the air stream lets you blanket a room with draftless heat. No more cold spots or drafts when you use Air Control Series No. 10 Registers. Remember too, that there is a complete range of sizes to fit your every need.



Air Controls New

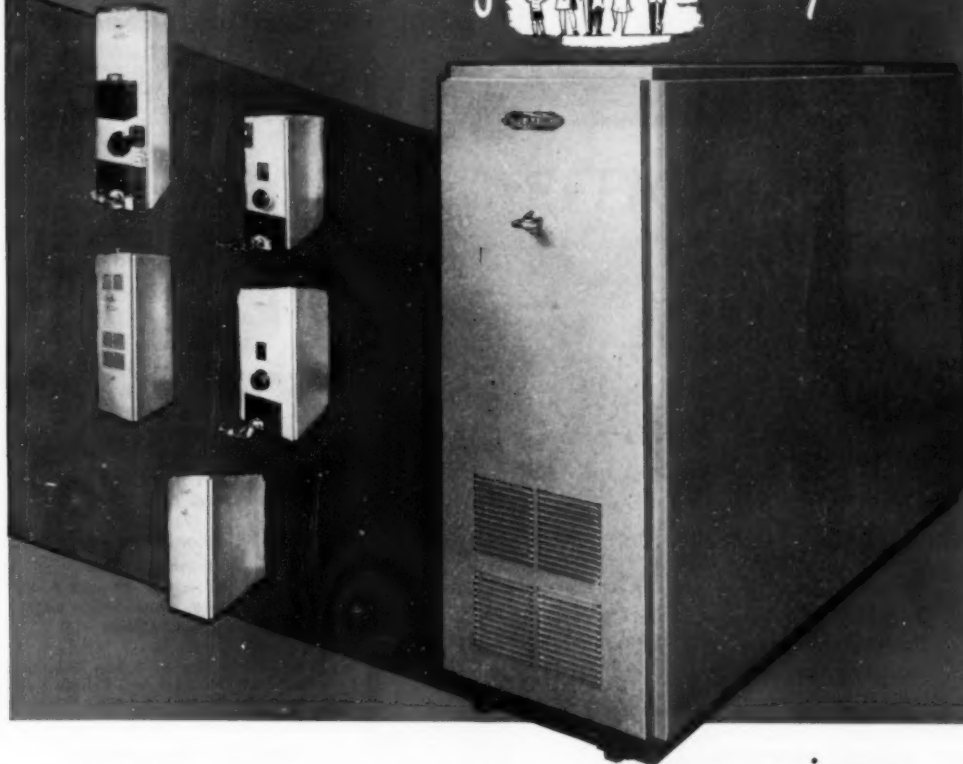
No. 51 POCKET CATALOG AND ENGINEERING DATA BOOK shows the complete line. Get one from your Air Control jobber or write to us. They are free!



No. 10 Series Registers, with the new Push Button Control Valve, are the best in Air Conditioning Registers. A combination of vertical adjustable fins and horizontal adjustable louvers give positive fourway control of the air stream, and the push button operator opens or closes the valve at a touch of the finger.

AIR CONTROL PRODUCTS, INC. COOPERSVILLE MICHIGAN

Meet a new member
of this fast-selling family...



the KO-Z-Aire 140 Winter Air Conditioner

THIS ruggedly-constructed, handsomely-finished 140 Series is KO-Z-AIRE's latest addition to the warm air heating line that's "stealing the show" with both dealers and home-owners.

For here, as in all models, KO-Z-AIRE engineers have outdone themselves to give you faster, easier sales, incorporating smart Advance Design styling into a factory-assembled, easy-to-install unit, with automatic controls, one piece, dust-leak proof welded steel base, and removable clean-out panels.

And you'll find a full range of sizes in both gas and oil-fired gravity and forced air equipment priced to sell — backed by new marketing policies which assure faster, more experienced service to distributors and dealers.

Much else goes with KO-Z-AIRE units to assure dependable, trouble-free, economical operation—minimized servicing problems. So, better not stop with looking, better send today for complete details about KO-Z-AIRE's Progressive Profit Program for dealers. Sure as sunrise you'll be money ahead in years to come.

Gas and Oil Fired Units from 70,000 to 450,000 BTU Input Available. Some Choice Dealer and Distributor Territories Still Open . . . Write Today!

KO-Z-AIRE

KO-Z-AIRE, Inc., Dept. AA-3 GENERAL OFFICES — RED OAK, IOWA • REPRESENTATIVES IN PRINCIPAL CITIES

AMERICAN ARTISAN



Member—Audit Bureau of Circulations
Member—Associated Business Publications



MANAGEMENT SECTION

NEWS ROUND-UP	53
SUBCONTRACTING FOR NATIONAL DEFENSE	57
RELY ON THE OLDER WORKERS' AGAIN	59
FREE SERVICE FOR YEAR	60
ACCOUNTING TERMS DEFINED	62
IT'S THE COPY THAT SELLS	64
DEFENSE HOUSING PLANS	67

RESIDENTIAL AIR CONDITIONING SECTION

OIL FIRED HEATING-VENTILATING SYSTEM	71
YEAR ROUND AIR CONDITIONING IN MINNESOTA HOME	75
PROPER ADJUSTMENT OF GAS CONVERSION BURNERS (II)	80
AMERICAN ARTISAN SHOW SECTION	83

SHEET METAL SECTION

FUNDAMENTALS OF SHEET METAL PRACTICE	93
REID — TEE INTERSECTING ROUND PIPE	98
TIME-SAVING TIPS	100
SUBCONTRACTING IN THE SHEET METAL SHOP	103

DEPARTMENTS

THE EDITOR'S NOTEBOOK	6
ASSOCIATION ACTIVITIES	109
ASHVE EXPOSITION	110
THE INDIANA ASSOCIATION	111
EQUIPMENT DEVELOPMENTS	115
NEW LITERATURE	138
SALES SENSE BY JACK BEDFORD	142
INDUSTRY ITEMS	143

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

EDITOR

JOHN E. PETERSON

ASSOCIATE EDITOR

JOHN MCCULLOUGH

ADVERTISING STAFF

WALLACE J. OSBORN
New York City
MUrray Hill 9-8293

ROBERT A. JACK
Cleveland
YEllowstone 2-1540

JAMES D. THOMAS
GEORGE C. CUTLER
Chicago
STate 2-6916

R. PAYNE WETTSTEIN
Los Angeles—DUmkirk 8-2286
San Francisco—YUkon 6-2522
Portland—ATwater 4107

Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A. Copyright 1951 by Keeney Publishing Company.

Publisher—FRANK P. KEENEY

Manager—CHARLES E. PRICE

Production Manager—L. A. DOYLE

Circulation Director—FRANK S. EASTER

Yearly Subscription Price—U.S. and possessions, \$3.00; Canada, Cuba, Mexico, South America, Central America, \$4.00; Others, \$6.00. Single copies, U. S. and possessions, \$35. Back numbers, \$60. January, 1951, Directory Issue, \$1.50 per copy. *Change in Address:* Report new and old address to publisher and local post office; deadline, 23rd-25th of preceding month. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Mendota, Illinois.

Founded 1864

MARCH, 1951

Volume 88, No. 3

AMERICAN ARTISAN, MARCH, 1951

Syncromatic LEADER... IN ENGINEERED WARM AIR HEATING EQUIPMENT GIVES YOU

EFFICIENCY

It costs a lot less to heat with a syncromatic.

Syncromatic employs its patented Counter-Flow design which literally "scrubs" the heat units out of combustion gases.

STABILITY

All Syncromatic heat exchangers, whether coal, gas or oil, are made from heavy gauge steel to give your furnace added insurance for safety and long life.

A COMPLETE

Line for all fuels and in ratings from 60,000 B.T.U. to 1,000,000 B.T.U.



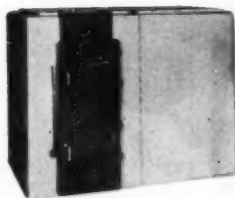
OIL HIGHBOY
85,000 B.T.U.



GAS HIGHBOY
75-100,000 B.T.U.



G.F.B. 410-11



C.F.B. HAND FIRED
Coal Gravity or Forced Air
90,000 to 250,000 B.T.U.



700 DE LUXE SERIES
110,000 and 146,000 B.T.U.



HI-CAP
OIL—GAS—COAL • 10 SIZES
330,000 to 1,000,000 B.T.U.

MANUFACTURED BY

Syncromatic Corporation
WATERTOWN, WISCONSIN

1931

20th YEAR

1951

*the editor's
notebook*

Introducing...

Charles Seel of Alexandria, Va.

Mr. Seel is introduced to AMERICAN ARTISAN readers this month with the first installment of a series of articles in the SHEET METAL SECTION, entitled Fundamentals of Sheet Metal Practice. The series summarizes correct practices the author has observed and recorded during a life in which he has been actively engaged in the trade. He presents his observations in a manner that generates interest in correct practices by apprentices and encourages comparison of accepted practices by journeymen.

Mr. Seel has been in the sheet metal field for 40 years. He was apprenticed in 1903 to a cornice and skylight shop at Elizabeth, N. J., where he served for four years as an apprentice and worked six more as a journeyman. Following this, he went into business with his father and in 1916 became president of the company, which was incorporated as Charles Seel & Sons. His duties covered work as estimator and layout man. Since that time his experience has included factory maintenance and industrial metalwork, air conditioning, and ship ventilation.

In 1941 he was engaged as a sheet metal instructor by the Philadelphia school board and served in this capacity for over two years. It was during this period, while observing the actions of trainees, that he decided a book should be written, to teach not only what to do but more particularly how to do the various operations.

Failure is the only thing that can be achieved without much effort.

PIONEER of the PREFABRICATED Chimney



VITROLINER

Long before prefabricated chimneys came on the market, we pioneered "VITROLINER SPECIAL FLUES" for the Army and Navy Defense Housing Program in '41. Today Vitroliner is still first, producing a high quality, light weight, packaged chimney — individually designed and completely prefabricated to fit the particular roof pitch of the house — a tailor made roof flashing and flue housing — no cutting or fitting required.

Vitroliner functions as a complete chimney for ALL home heating equipment. Used nationally — listed by Underwriters Laboratories for all fuels. Saves approximately one-half the cost of masonry construction.

Time tested, proven practical — easily and quickly installed — VITROLINER offers the modern home builder these money saving advantages —

FEATURES

- LOW INITIAL COST
- SAVES FLOOR SPACE
- FINEST QUALITY MATERIALS
- INSTALLED IN 1/2 HOUR
- WEIGHS 10-15 LBS. PER FT.
- IMPROVES HEATING EFFICIENCY
- PROVIDES ATTIC VENTILATION
- MFD. IN 6", 7", 8" DIAMETERS



FOR FURTHER INFORMATION WRITE TO:
CONDENSATION ENGINEERING CORPORATION
1511 W. POTOMAC AVE., CHICAGO 51, ILL.

*the editor's
notebook*

Soot Export

Dr. Wallace E. Howell, New York City's "rainmaker", told members of the American Meteorological Society meeting in New York that the city's biggest export is soot. He estimated that at least 384,000 tons of it rained down over a 40 mile area in a year. In a prominent article in the *Herald Tribune*, Dr. Howell was quoted as having stated that Manhattan exports the most, producing 138,000 tons, of which 25,000 tons fall back on the island, the balance of 113,000 tons floating elsewhere, mostly to Long Island.

War Subcontracting

The National Production Authority (NPA) has outlined these points on which military contractors need information about firms they are considering as possible subcontractors:

- Plant—Facilities, location, etc.
- Equipment—Type, size, condition.
- Capacity and production—Both current and scheduled.
- New tooling—Capacity or source.
- Delivery facilities—Available rail sidings, air shipping, etc.

Organization and personnel —Including key personnel experience, number and kinds of employees, etc.

Cost records—Their adequacy to satisfy government requirements, ability to provide government with copies of suppliers' and subcontractor's invoices.

Financial ratings — Necessary, because prime contractor may have to supply costly materials and tools for subcontract.

Subcontracting experience—

Hot Tip
for Cold Weather
PROFITS

TORIDHEET

Pressure-Type Oil Burners

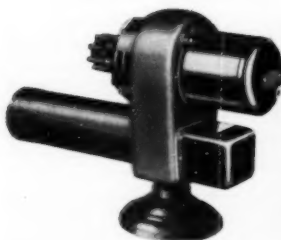
• So quick and easy to install you don't have to wait for warm weather. Pressed steel housing makes it light enough for one man to handle easily, saves freight expenses, too.

Features your customers will like include: pre-metered air flow; complete absence of exposed gears, buttons or levers; and, above all, famous TORIDHEET reliability of operation, developed from 28 years of pioneering research.

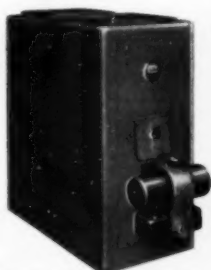
Sell TORIDHEET and take pride in selling a product that sells easily and *stays sold*.



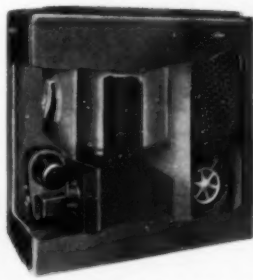
TORIDHEET Model J gun-type conversion unit. Capacity $\frac{1}{4}$ to 3 gal. per hour. An ideal unit for small to medium-large homes.



TORIDHEET Model L gun-type conversion unit. Capacity $2\frac{1}{2}$ to 6 gal. per hour. Consistent performance for large residential and light commercial uses.



TORIDHEET Model OGA-65 low cost gun-fired winter air conditioning units specially designed for today's small homes.



TORIDHEET Model OGA gun-fired winter air conditioners provide clean automatic heating comfort for medium and large sized homes.



TORIDHEET Model OGU Boilers—ideal for radiant panel heating.

Other Toridheet units for every need...every budget...Gun Burners...Gun Fired Boilers and Furnaces...Gas Conversion Burners and Gas Fired Furnaces

CLEVELAND
Toridheet
AUTOMATIC HEATING

TORIDHEET DIVISION
CLEVELAND STEEL PRODUCTS CORPORATION
7306 Madison Avenue
Cleveland 2, Ohio

Affiliated Canadian Manufacturers: Conroy Mfg. Company, Ltd., Catherine St., St. Catharines, Ont.

the editor's notebook

Names of former prime contractors and description of items produced.

A new booklet issued by the Senate Small Business Committee answers 30 frequent questions on federal procurement.

As to hiring a so-called 5 percent to help get a government contract, it says, go slow on this, but on the other hand, there are honest agents who may save you some time and help to keep you abreast of the current procurement picture.

The seven page question and answer leaflet, entitled *Selling to Your Government*, is available without charge from the Senate Small Business Committee, Senate Office Bldg., Washington 25, D.C.

Sesquicentennial

Many companies and communities during 1951 will join with Revere Copper and Brass Incorporated in a celebration of the founding of the copper fabricating industry in the United States by Paul Revere in 1801.

Noted as a patriot, hero of the ride to rouse the Minute Men against the British in 1775, and admired also as an artist in silverware, Revere's industrial accomplishments are less well known but are even more solid claims to immortality, in the opinion of historians and industrialists.

A many-sided man, Revere in the 18th century cast bells of bronze that still ring in churches and town halls of New England. He made dentures and engravings of copper. But he did not know how to "work" copper, nor did anyone in the United States in Revolutionary times. As late as

Sentry

AT-A-GLANCE

REMOTE and DIRECT

READING

TANK GAUGES

FOR BASEMENT TANKS:
Type D-O for 2" openings.
Type D-10 for 1 1/2" openings.

For accurate, easy reading of tanks — indoors, outside or underground.



FOR UNDERGROUND TANKS: Type D-U, shown at right, for 2" openings only.



Dependable, Inexpensive, Weatherproof... Simple Mechanical GAUGES, Easy to Install

Accurately indicates liquid level in remote storage tanks at all times — Not affected by specific gravity oil changes or variations. Simplified mechanical operation eliminates unnecessary fittings, bulbs or levers for oil men to tamper with — no need for access to building. Can be installed for dual location readings — indoors and out. Non-corrosive stainless steel and brass extension lines connect tank float with cast aluminum, weatherproof, thermometer type indicator — calibrated in fractions. Easy to read, unconditionally guaranteed. Write for folder showing complete line.



KRUEGER Sentry GAUGES

GREEN BAY • WISCONSIN

the editor's notebook

1800 copper sheathing, bolts, and spikes had to be imported from England. Paul Revere's aid was sought in 1797 when bolts imported for the building of Old Ironsides proved to be the wrong size. He solved the problem of how to reshape them and went on to a larger project: the building of a mill for rolling copper for sheathing.

The story of his struggles to learn a secret unknown here, of how he won his first order from the Navy and raised the capital to start his mill in Canton, Mass., and his eventual success with his manufacturing process is one of the epics of American industry. It is known that Revere turned out copper sheets for the first time in the fall of 1801.

What They Said

Secretary of Commerce Charles Sawyer at the Annual Dinner of the Chamber of Commerce of Pittsburgh:

In April 1924 a famous lecturer, whose name incidentally and interestingly enough was Steel, in a lecture at a foreign university paid this great compliment to American efficiency:

American efficiency is that indomitable spirit that neither knous nor will be deterred by any obstacle, that plugs away with businesslike perseverance until every impediment has been removed, that simply must go through with a job once it has been tackled...

On the chance that some of you may not recognize this personality, I may say that he is better known to you by his Russian name for steel—Stalin. That, 26 years ago, was Josef Stalin's ungrudging and complimentary appraisal of America. I feel certain that he thinks no less respectfully of

**THIS MONTH'S
MERCHANDISING
IDEA**



With fuel costs high, the fuel savings offered by a Field Draft Control have a strong appeal both to oil and coal users.

SERVICE TODAY CAN MEAN SALES TODAY...AND TOMORROW

With fewer new furnaces available to sell in 1951, Field Draft Controls will offer both dealers and home-makers special advantages: For the dealer they mean a profitable sale with a large volume potential. For the home-maker a Field Draft Control means important fuel savings, longer furnace life.

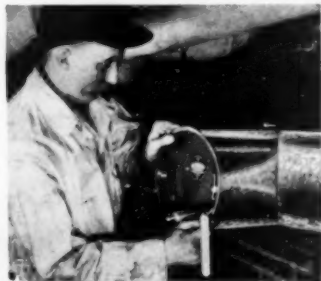
For hand-fired furnaces which must be kept in operation, the Field Barocheck is a "must". It is a combination draft

control and check damper that reduces furnace tending, cuts the coal bill, assures more even heat and lengthens furnace life by preventing overheating. Take a Barocheck along on every hand-fired call. The draft control on oil-fired furnaces, too, must be replaced periodically.

Draft Control sales today are good insurance for heating plant sales tomorrow.



Field Control literature prominently displayed brings extra leads, extra sales for draft controls.



Installing a Field Draft Control manufactured by Field Control Division, Mendota, Illinois.

**"Visit Our Booth #130, National Oil Heat Exposition,
Navy Pier, Chicago, April 2 - 5".**

field
means finest in
DRAFT CONTROLS
... And There's A Field
Control For Every Need!

field
TYPE
M



First and finest for all types of automatic heating equipment.



field
TYPE
R

First and finest for all types of space heaters and ranges.

field
BAROCHECK



First and finest for hand-fired furnaces and boilers, a combination check damper and barometric draft control.



field FUEL
SAVING SYSTEM

A newer, finer, more trouble-free damper-motor set with automatic spring return, built-in limit control, "stake-switch", and booster fan switch.

WRITE for proof of why Field is First and Finest — first choice for the finest in heating equipment.

field CONTROL
DIVISION
H. D. CONKEY & CO., MENDOTA, ILL.
AFFILIATES:
Conco Building Products, Inc.
Brick - Tile - Stone
Conco Materials Handling Division
Cranes - Hoists

*the editor's
notebook*

the genius of American business today.

S. C. Hollister, Dean, College of Engineering, Cornell University:

We are short of engineers. As we advance in war preparations the shortage will be greater. As one contemplates the dependence upon engineers in the task before us the seriousness of a shortage in this part of our manpower becomes evident. It comes about because there has been a falling off in enrollments in engineering colleges, largely due to a widely and erroneously held belief that engineers were in oversupply. The shortage will deepen if engineers are drafted or called up as reservists and used in positions for which engineering training and experience are not mandatory.

The present situation already shows tightness in all fields and critical shortages in many. On August 3, 1950, the Secretary of Labor placed all branches of engineering on the list of critical occupations. In all the major branches, the shortage of engineers is becoming progressively more critical, especially in aeronautical, chemical, electrical, and mechanical manufacturing fields. Men with a few years of experience are almost unobtainable.

Mobile Laboratory

Real estate and building editors recently watched how scientific heating research has taken another step closer to the people for whose comfort it is being conducted.

As guests of the National Warm Air Heating and Air Conditioning Association, they inspected the operation of the association's new mobile field laboratory testing program in action.



HEATRAP

5 WAYS A BETTER FURNACE

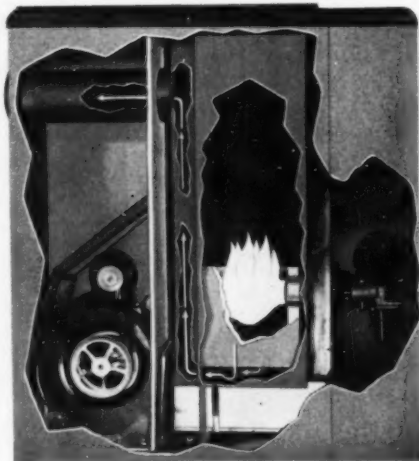
50% MORE HEAT Unique design results in 50% more heat transfer per square foot of heat exchanger surface.

4" SHORTER 56" height permits installation in basements where other furnaces won't fit.

LIGHTER WEIGHT Saves substantially in shipping, handling and storage costs.

LOW STACK TEMPERATURE Hot gases used efficiently instead of passing up the chimney.

LOWER PRICE Makes sales stick where budgets are slim and costs are scrutinized.



Start new, profitable business coming your way with HEATRAP. Ask for literature and new low prices.

J. V. Patten Company
SYCAMORE, ILLINOIS, U.S.A.

ESTAB. 1898 • INC. 1928

*the editor's
notebook*

The new field testing program centers around the use of a truck-contained laboratory which can be driven right into the building sites of builders and realty developers. Purpose of this laboratory on wheels is to test the comfort producing results of the newer and more unusual types of warm air heating systems which have been installed in recently built homes.

The laboratory is equipped with over 400 lbs of the most modern electronic heat testing apparatus. Included in this equipment are eight point automatic temperature recorders which maintain a constant record of the temperatures at eight selected points throughout the house. Another type of recorder enables the project research investigator to check the temperatures in any one of 24 different locations in the house. Thermocouples located in all rooms throughout the house constantly sample the temperatures in their immediate vicinity, at the ceiling, at the floor, and at the sitting level 30 in. above the floor. At the same time a constant record of the outside temperature is kept. Thus, it is possible to record a continuous picture of the temperature pattern throughout the entire house and note how it relates to changes in outside temperatures.

The laboratory will be used to test heating systems in homes across the nation. It is anticipated that it will be possible to achieve the equivalent of ten years formal research in two years by using this means. It is further anticipated that the test data obtained will prove of tremendous benefit both to the warm

The Flying Shear another active symbol of Wolff Metal Service



A flying shear line for the production of 24 gauge and lighter sheets is now in operation at Benjamin Wolff and Company. It represents a simple and direct extension of the Wolff idea of providing Midwest industry with a productive warehouse service . . . one that gets things done for customers better, faster and easier than any other metals warehouse source.

Your interest in calling Wolff for your requirements is always appreciated. Write — or phone WALbrook 5-3200.

Carbon Steels, Stainless Steels, Aluminum, Copper, Tin Plate, Metal Decorating

BENJAMIN WOLFF & COMPANY

General Office and Warehouse — 3000 North Taylor Street, Chicago 24, Ill.

Warehouse Office — 175 W. Wacker Drive, Chicago 5, Ill.

the editor's notebook

air industry and the building industry in advancing both heating and construction methods towards more comfortable heating.

Federal Jobholders

Washington is still the national capital but it is losing its dominant position as the chief concentration point for bureaucrats. The latest figures, for example, show that California has 179,000 civilian federal employees, or more than the District of Columbia; New York has almost as many; Pennsylvania isn't far behind.

The federal government is the nation's largest employer and its payrolls and federal personnel policies are setting work patterns throughout the land. A report issued by the Joint Congressional Committee on Reduction of Non-essential Federal Expenditures shows that federal employment never dropped much below 2,000,000 after World War II and that since the outbreak of the Korean war, new workers have been added at an average rate of about 1,000 a day.

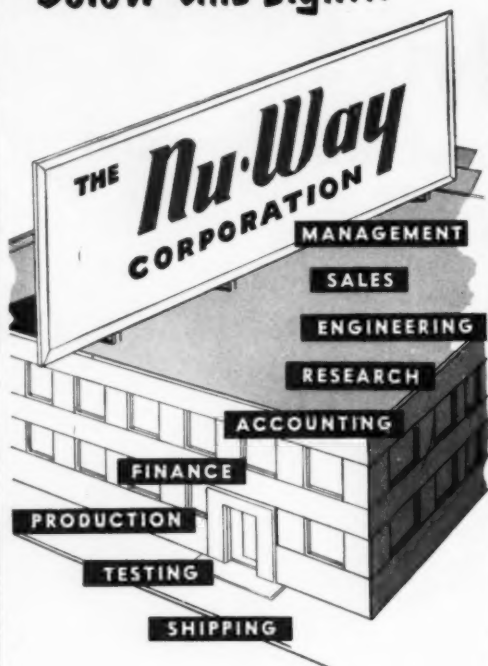
By next June, the report points out, government payrolls will be higher than the \$8 billion a year peak of World War II, and will still be rising.

Grave Matter

While installing a furnace in a country parish church near Detroit Lakes, Minnesota, Earl King found it necessary to run a return air duct under an unexcavated part of the church. To his surprise, he encountered what appeared to be a brick wall. Cutting through this wall he found himself standing in a small vault like room.

Old timers of the community recalled a half-forgotten legend

Below this sign...



It takes a lot more than high sounding titles for departments to carry on the job of producing Nu-Way Oil Burners. It takes competent people from the department head on down working in close cooperation to build and market a quality product. That these jobs are being well done is amply proved by the continued increase in the number of homes depending on Nu-Way Oil Burners for automatic heat.



THE
Nu-Way
CORPORATION
ROCK ISLAND, ILLINOIS

Sold Through Jobbers and Distributors
Also Special Application for Furnace and Boiler Manufacturers
"Automatic Oil Heat Exclusively Since 1921"

the editor's notebook

to the effect that the priest responsible for the building of the church had passed away during its erection, that his parishioners had buried him underneath the edifice he had labored to build. Later, his congregation migrated to another section of the country, taking the body with them and sealing the vault.

The discovery aroused considerable interest and almost the entire congregation turned out to view the vault and admire King's installation. "Believe it or not," said King, "it's the first time I ever installed ductwork in a grave!"

Finger on the Pulse

Pollsters today are concerned almost exclusively with what are really variations on the same somber theme of our times: with atom bombs, Russia, and government centralization here at home. Gallup, for instance, found that 55 per cent of us think the U. S. is already involved in World War III while only 31 per cent believe the Korean affair will stop short of a world war. He found that 81 per cent of us think Russia is out to dominate the world. And he found that in cities of at least 100,000 population, 71 per cent of us fear that there is a good or fair chance of being attacked with atom bombs.

Asked to name the most dangerous threats to the welfare of the U. S., from a list of five, the public rated them in this order: Communist sympathizers in government and public life, 67 per cent; inflation, 52 per cent; strikes and labor disputes, 43 per cent; unemployment, 19 per cent; scarcity of steel, coal, and other raw materials, 14 per cent.



**Same man....
Same shop....
Same shop crew....
BUT TWICE THE PRODUCTION WITH A
LOCKFORMER!**

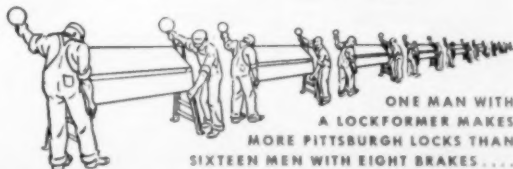


One man and a Lockformer turns out more Pittsburghs, **IN ONE DAY**, than two men, working with hand breaks, **CAN MAKE IN A WEEK!** This terrific savings in seam-making time cuts *overall* fabrication costs more than in half—more than doubles the capacity of *any* shop—with *no* increase in shop help, with *no* increase in shop floor space.



That's why Lockformers have become the "standard of the Industry"—why sheet metal men have bought more than 20,000 Lockformers in the past ten years—why Lockformer users *continue* to buy Lockformers when additional machines are needed.

You'll find the right machine for your shop and your budget in Lockformer's complete line of metal forming equipment. Send for your free copy of the Lockformer catalog today!



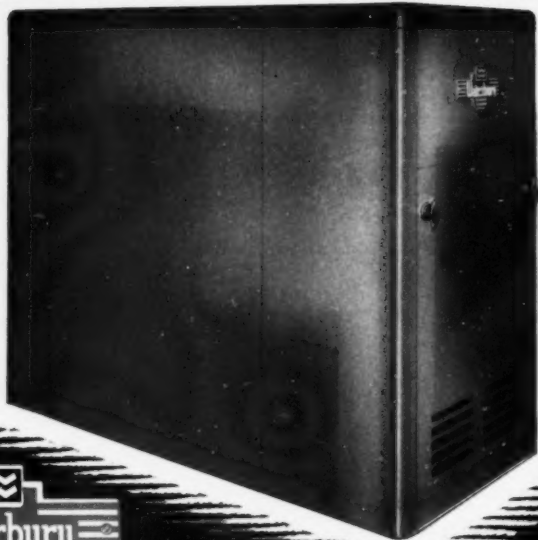
ONE MAN WITH
A LOCKFORMER MAKES
MORE PITTSBURGH LOCKS THAN
SIXTEEN MEN WITH EIGHT BRAKES....

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

Waterbury

pleases your most critical prospect
because, "It's what's under the
casing that
counts!"



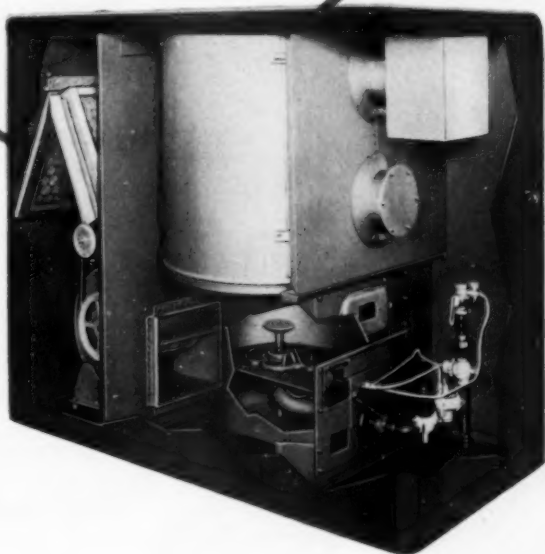
the WATERMAN • WATERBURY Co.

1122 JACKSON STREET N.E. • MINNEAPOLIS 13 MINNESOTA

yes—"it IS what's under the casing that counts!"

Your critical prospects look beneath the surface beauty of a furnace or winter air conditioner . . . seeking the performance that means heating satisfaction. And their search will be rewarded in a Waterbury, for the basic premise in the design and manufacture of these units is the fact that "It's what's *under* the casing that counts!" Customers respond, of course, to the attractive appearance of a Waterbury, but you'll find that the dependability and economical operation of every unit in the line are your assurance of a growing list of customers.

Waterbury offers a complete line of furnaces and winter air conditioners, with a unit of the correct size and fuel type for every prospect. Product quality, buyer confidence and a sound dealer policy make association with Waterbury good business.



Aerofuse

IN ATLANTA

Here in the progressive capital of Georgia, outstanding air conditioning jobs are Aerofuse jobs... specified and installed by prominent engineers, architects and contractors who know from experience they can depend on Aerofuse Diffusers to meet the most rigid specifications of efficient performance and modern appearance where it counts most... at the vital point of air delivery. This acceptance of Aerofuse in Atlanta is another important addition to the long list of cities from coast to coast where Aerofuse installations read like the "Who's Who" of buildings.

TUTTLE & BAILEY inc

NEW BRITAIN, CONNECTICUT

PECK & PECK



DAVISON-FAXON COMPANY



WSB-TV CONTROL ROOM

KRAFT FOODS COMPANY

Other typical Aerofuse installations in the Atlanta area.

FIRESTONE TIRE & RUBBER CO.

GENERAL MOTORS CORP.

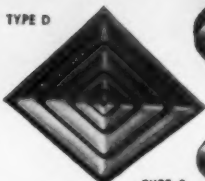
LIBERTY MUTUAL LIFE INSURANCE CO.

TEXAS CO.

THE AEROFUSE LINE... a complete range of types, styles and sizes to meet the requirements of every job... for full details, size selection information and pricing data, send for **CATALOG 104**.



TYPE EAC



TYPE D

TYPE R



TYPE ES



TYPE H



TYPE E



TYPE LF



TYPE S



FANS FOR '51

FRESH-AIR MAKER

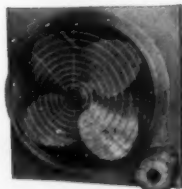
A line you will want to acquire, designed for best performance, good

looks and to sell. Priced right. A generous assortment of sizes and types that people want. Over fifty models. All will deliver lots of air, quietly and for long years. Excellently built.

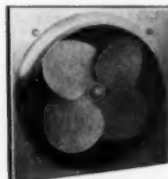
You cannot tie up with a better prospect for profits.



ADJUSTABLE WINDOW FANS



WINDOW FANS



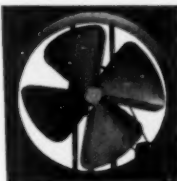
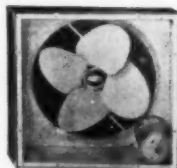
EXHAUST FANS



CEILING PACKAGE UNITS

CABINET FANS—WINDOW OR FLOOR

MODELS that HIT THE BULL'S-EYE FOR HOUSING, HOMES, INDUSTRIAL JOBS. A HELPFUL CATALOG FOR YOUR ARCHITECT AND BUILDER FRIENDS.



ATTIC FANS

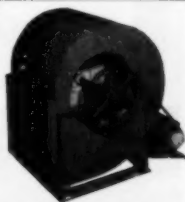


Lots of PRACTICAL, PLEASING SELLING FEATURES

you will want to know about.

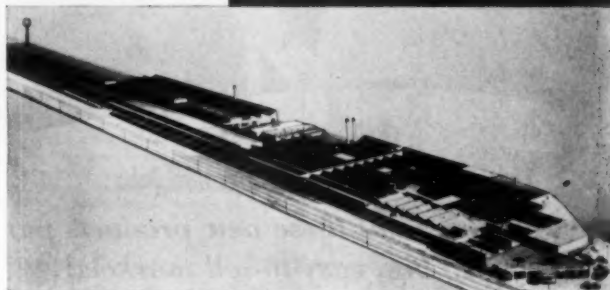
Send for literature.

The Hy-Duty line will supply your needs for centrifugal blowers, SINGLE INLET... DOUBLE INLET... DIRECT DRIVEN UTILITY UNITS. 5" to 25" wheel diameter, a few hundred CFM to 25,000. Compact, strong, top delivery, certified ratings.



**SCHWITZER-CUMMINS COMPANY
VENTILATING DIVISION
INDIANAPOLIS 7, INDIANA
ENGINEERS AND MANUFACTURERS**

of Fine Fans for 31 years



AMERICAN-Standard

First in heating...first in plumbing

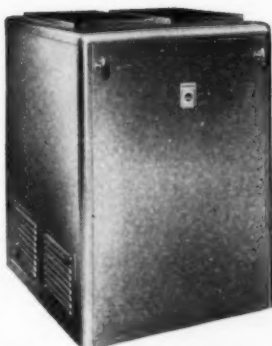
... Again
AMERICAN-Standard
helps you sell
with these two
dramatic new
products!



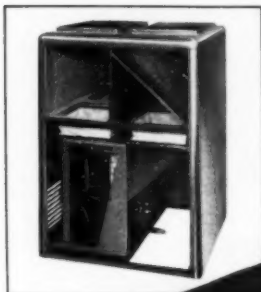
There's money in modernization jobs

*... and these new products put you right on top
of two big, easy-to-sell markets!*

The new Mayfair is a self-contained summer cooling unit designed for easy connection to forced warm air heating systems to form a year 'round home air-conditioning installation. Its attractive Forge Red jacket harmonizes with any surroundings.



The Mayfair has a 2-horsepower refrigeration system. It is equipped with twin, 1-horsepower hermetically sealed refrigeration circuits, each readily removable. One circuit is cut off when less cooling is desired.



Summer comfort for the entire home

A brand new addition to the famous American-Standard line, the Mayfair is a cooling unit designed for the important small to medium home market.

Featuring a hermetically sealed cooling system—tested and sealed at the factory—the new Mayfair is as dependable and simple in operation as a modern refrigerator. Thermostatic control automatically assures cool comfort in hot weather. Mechanically cooled and dehumidified air circulates gently throughout the house.

The Mayfair Summer Air Conditioner utilizes the ductwork of existing forced warm air heating systems. When installed with other American-Standard units like the Mohawk or Seneca Winter Air Conditioners, the Mayfair provides year 'round home air conditioning at its best!

You'll find many opportunities to sell the Mayfair for modernization jobs . . . as well as for new construction. Be the first in your community to promote it! For details, contact your wholesale distributor.

THE MAYFAIR SUMMER AIR CONDITIONER

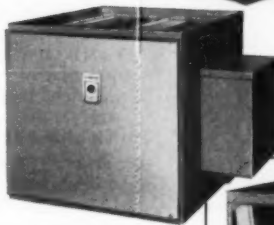
THE MAGNE-FILTER AIR CLEANER

The outstanding dry type electronic air filter

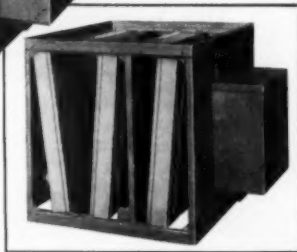
Here is a brand new electronic air filter that's going to mean big business for all who handle and feature it!

This latest addition to the Sunbeam line, the Magne-filter Air Cleaner, is an easily installed, dry-type electronic air filter that traps even the smallest particles of dust and dirt. No other filter is needed. Cleaning the air by electrical attraction, the Magne-filter effectively removes pollen, air-borne bacteria—even the dust and smoke that smudge walls and furnishings.

It is easy to visualize the sales possibilities of such a product! Every home with a winter or summer air conditioning unit is a prospect! Made in sizes for all residential requirements, the Magne-filter will be an indispensable part of every air conditioning unit. Be sure that you are prepared to tell prospects all about it. For details, contact your wholesale distributor.



Housed in durable steel, the Magne-filter is safe and trouble-free. It may be mounted in return duct of heating or cooling unit as shown in the typical installation at left, or installed on its side in limited space applications.

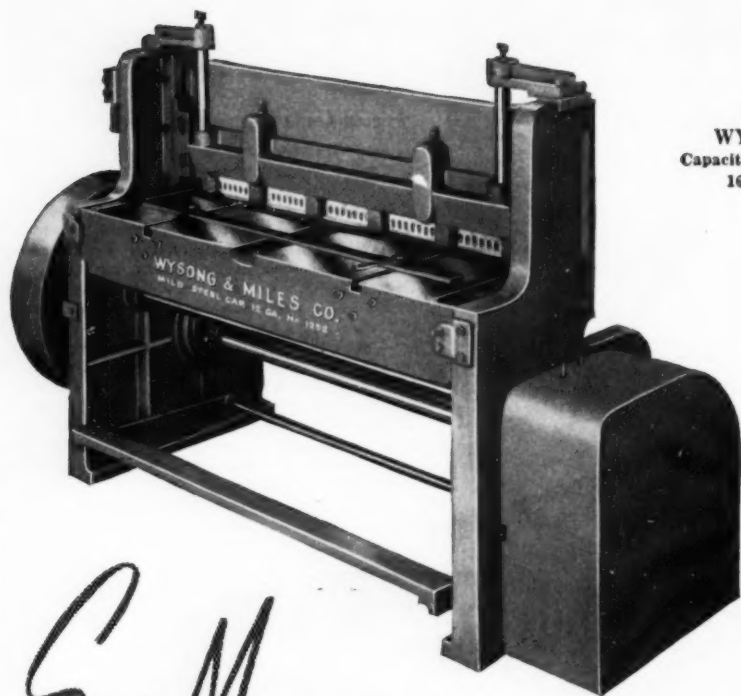


The Magne-filter has cells as its collector elements which continue to filter the air even when electrostatic action is interrupted. Light, sturdy, disposable, these convenient filter cells have a larger surface area than ordinary filters, assuring longer service.



American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Pa.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • RUSS HEATER • TONAWANDA IRON



WYSONG No. 1252
Capacity: 52", 12 ga., mild steel.
16 ga., stainless steel.

Save Money WITH WYSONG'S 12 GAUGE SERIES

If most of the sheets you shear are 12 gauge or less, you now can get an economical 12 gauge shear to meet your requirements.

To insure top performance at a 12 gauge rating, Wysong 12 gauge series are all tested at the factory on 10 gauge sheets. Made in 52-inch, 6 foot, 8 foot and 10 foot cutting lengths, one of these economical shears meets the full shearing requirements of most sheet metal shops.

STANDARD EQUIPMENT INCLUDES . . . Motor with controls and electrical equipment; ball bearing, precision Back-Gauge; embedded, adjustable, stainless steel Scale; slotted metal Finger Guard; Non-Repeat Unit; and 4-edge Blades.

Rigid Wysong *Hi-Tensile* Casting construction is combined with time saving features to give speed and accuracy in operation, plus many years of satisfactory service.

Each Wysong shear is tested for 24-hours of operation before leaving the factory and is shipped *completely equipped* and ready for continuous operation.

Wysong builds a complete line of Air, Foot and Motor powered squaring shears for the Sheet Metal Shop. See your dealer or write for Catalog No. 44.

THE WYSONG 12 GAUGE SERIES

- No. 1252 . . . 52 inch cutting length
- No. 1272 . . . 6 feet cutting length
- No. 1296 . . . 8 feet cutting length
- No. 1210 . . . 10 feet cutting length

WYSONG and MILES CO.

GREENSBORO, NORTH CAROLINA



VICTOR

Quality

FOR THE DEALER WHO SELLS THE BEST

all

VICTOR

**oil • gas • deluxe coal
furnaces warranted
for 15 years**

Buyers across the nation are turning to the furnace with quality that lasts . . . VICTOR. VICTOR dealers everywhere find greater profit through easier sales with the line known for quality since 1890. Regardless of their demands . . . forced-air or gravity . . . OIL . GAS . COAL . . . VICTOR dealers are equipped with nearly 100 models and sizes to fit every heating need.

Write Today

At present there are a few EXCLUSIVE VICTOR territories available. Investigate this quality line that makes more money for you.

Exclusive Fuel Saving Fins

The additional heating surfaces provided by exclusive VICTOR FINS cut fuel bills 20-30%. VICTOR'S miniature furnace demonstrator dramatically proves the savings and closes your sales fast.

VICTOR IS
THE ONLY
FURNACE WITH
FUEL SAVING

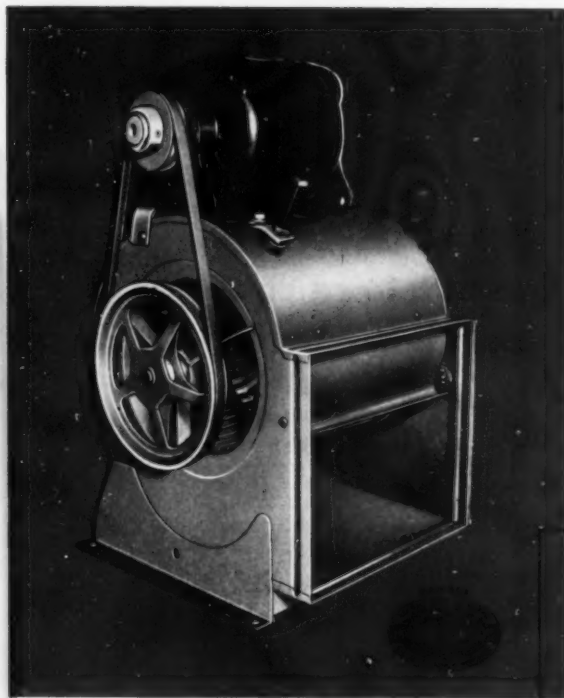


FINS

Quality Furnaces Since 1890

HALL-NEAL FURNACE CO.

1322-42 NORTH CAPITOL AVE., INDIANAPOLIS 7, IND.

LAU**offers You America's Most Outstanding****Blower Assembly Unit****Further Improved... Second to NONE in '51!**

**The ALL NEW... A7DD Direct-Drive
DOUBLE INLET BLOWER**

Perfect unit for in-a-wall gas and oil furnaces... has fingertip adjustment for wide range 7-speed control. For furnaces to be rated at capacities from 44,000 to 76,000 b.t.u. per hour (bonnet) at 100° temperature rise—or capacities from 31,000 to 54,000 b.t.u. per hour (bonnet) at 70° temperature rise.

The New Series "A" Unit

Now you can have the last word in product development—new, vastly improved LAU SERIES "A" BLOWER ASSEMBLY. It is the all-time, outstanding achievement in the blower field. Overall size is considerably smaller than formerly. Many features are revolutionary—exclusive with Lau—and protected. Entire unit is die formed—lending itself to mass production on precision-built equipment with reflected low costs.

10 Outstanding Features:

1. 1-Piece Motor Mounting
2. Bearing Bracket
3. Bearing Assembly
4. Positive Alignment Wheel to Venturi
5. New, Improved Lausteel Pulley Wheel
6. Housing Base
7. Center Suspension Wheel
8. Improved Discharge Outlet Design
9. Redesigned Scroll
10. Off-Set in Scroll Sides



The A7DD is the **ONLY** unit completely UL approved, covering the **ENTIRE** unit (also approvable in combination with furnace)

THE**BLOWER COMPANY • DAYTON 7, OHIO**

Write Dept. A for Full Information

Whatever You Need

Luxaire

Can Supply It

Increase Your Sales
Increase Your Profits

Luxaire
The complete line of Heating
and Air Conditioning Units
for Any Kind or type of
Heating Installation
For Gravity, Forced Air
or Perimeter Heating
Cast Iron or Steel Heating
Element
For GAS • OIL or COAL

By concentrating your sales
efforts and your selling abil-
ity, on one well known name
and one line of heating
equipment, you can increase
both your volume of business
and the amount of your profits.

By concentrating your purchases on one line of fur-
naces, you can reduce your inventory and speed up
your turnover of capital.

If you concentrate on Luxaire you can follow this
formula for increasing profits.

You can follow this formula for increasing profits,
because the sales-compelling Luxaire line which is
easiest to sell, is also the competitively priced Luxaire
line which is easiest to buy.

See Your nearest Luxaire jobber for catalogs and
prices.



Series A
Gas-Fired Steel
Air Condition-
ing Unit.



Series H
Gas-Fired,
Steel Utility
Air Condition-
ing Unit.



Series G
Gas-Fired
Gravity Furnace
Available with
Steel or Cast Iron
Heating Element.



Series CA
Gas-Fired
Air Conditioning Unit,
Cast Iron heating
element.



No. HC-95-E
Gas Counter-
flow Unit, for
Slab Floor,
Perimeter
Heating.



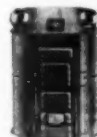
Series O
Gun, Oil-Fired
Air Conditioning
Unit. Steel
heating element.



No. VHC-75-E
Oil Counter-
flow Unit, for
Slab Floor,
Perimeter Heating.



Series AC-F
Coal-Fired Air
Conditioning Unit.
Steel Heating Element.



Series No. 600
Coal-Fired
Gravity Furnace.
Steel heating element.



Series C
Coal-Fired,
Cast Iron
Furnace.

THE C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO
Luxaire HEATING & AIR CONDITIONING UNITS

the **BIG NAME** in **HEATING**

— for warm air heat!

Tailor-made for today's homes!



Mueller Climatrol

Type 110 gas-fired Winter Air
Conditioner. Five sizes: 60,000
to 160,000 Btu input.

**...meets your customers' demand for
warm-air heating at its best!**

Yes, Mueller Climatrol is a famous name — nationally advertised, nationally known for heating leadership for more than 94 years. When home owners think of heating they naturally think of Mueller Climatrol. The rest is up to you.

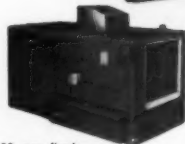
And Mueller's complete line helps you follow through. No matter what your customers' needs may be — you can fill the bill best with Mueller Climatrol: sizes and types for every home... for any fuel... forced-air or gravity... steel or cast iron... hi-boy, low-boy or horizontal design... conversion

burners... unit heaters — the Mueller Climatrol line is really complete.

In addition, you deliver the finest quality, in designs tailor-made for today's homes and built to deliver years of solid heating comfort! Mueller Climatrol has sound engineering, compact styling — everything it takes to satisfy today's customers — everything it takes to keep you way ahead of your competition! Write for our new "all products" catalog on this profit-proved line... L. J. Mueller Furnace Co., 2030C W. Oklahoma Ave., Milwaukee 15, Wisconsin.

Winter Air Conditioners

Types 109 (gas)
and 209 (oil),
convertible. Two
sizes: 100,000
and 135,000 Btu
input.



Type 155 gas-fired
Horizontal Winter Air
Conditioner. Two sizes:
60,000 and 90,000
Btu input.



Types 105 (gas) and
202 (oil), convertible.
Nine sizes: 100,000
to 675,000 Btu input
in gas. Oil to 225,
000 Btu input.

Gravity Furnaces

Type 111, gas. One
size: 90,000 Btu in-
put.



Types 101 (gas) and
202 (oil) convertible.
Four sizes: 90,000—
180,000 Btu input.

Conversion Burners



Type 450 oil
conversion burner.



Type 500 gas
conversion burner.



D-117

Mueller Climatrol

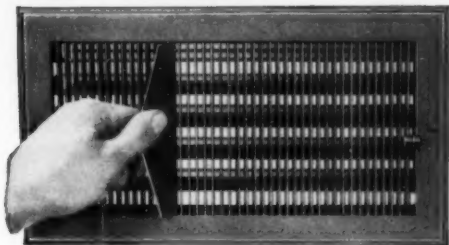
FOR GAS FOR OIL FOR COAL



ALWAYS OUT-IN-FRONT!

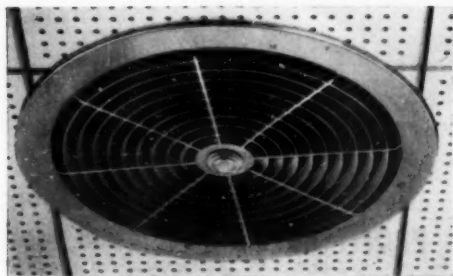
We maintain our High Standard of Quality — Regardless of material shortages and difficulties of procurement. One thing you can always rely on — U.S. will not deviate from its position of quality and volume leadership in the register industry. There will be no sacrifice in quality of workmanship.

That SUPERB LINE of A-C REGISTERS



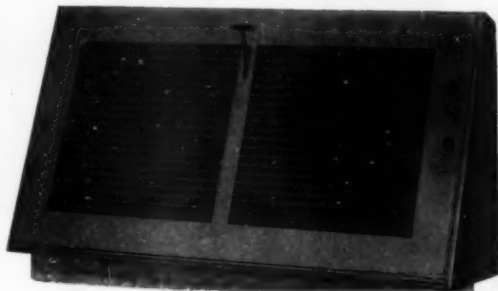
The Incomparable No. 256

The Most Practical "ALL-Purpose" Line of all Air-Conditioning Registers. It gives you 4-way Directional Flow through Multiple Rear Valves and Front Vertical Bar Grille (22° Right and Left Flow standard setting). Can be installed in sidewall or ceiling with any style stackhead, square or round back, or at end or side of square duct.



No. 500

The Round Ceiling Outlet that takes the "fringe" out of Ceiling Outlet Costs. Gives you highest efficiency at lowest cost. Send for Catalog No. 51.



No. 165-3 3/4

New "Out-of-Wall" register ends old house installation troubles. Avoids cutting walls, floors, carpets, rugs, sills, and joists. Ideal for perimeter heating. "Makes Forced-Air Possible where otherwise impossible."

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS

KANSAS CITY

ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

SWIRLING BURNER MFG. CO., INC.
their NEW IMPROVED TYPE
VERTICAL ATOMIZER BURNER

"Swirling Flame"



See us
at the
Show in
BOOTH
159

DEALERS:—

We invite your inquiry as to how you can
be a "Swirling Flame" Dealer. Our Dealer
Plan is most attractive.

Gives you all these SALES and
PROFIT advantages...and more

- Bigger and Safer Profits
- Installation Problems greatly simplified
- No Combustion Chamber required
- No Carbonizing on Nozzle or Ignition Points
- Higher CO-2... Greater Combustion Efficiency
- No Profit-absorbing Service Calls
- Popularly Priced for the Popular Market
- Approved by National Board of Underwriters

SWIRLING OIL BURNER MFG. CO., INC.
221-223 West 58th Street, New York, New York

CONCENTRATE Your Buying



MONCRIEF

For PROFITABLE Selling

The most complete
line of Heating and
Air Conditioning
Units for all types
of fuel . . . for any
type of heating
Installation

STEEL
Heating Elements
CAST IRON
Heating Elements



Whether you're interested in one unit, or a dozen or a carload: Whether they're for Gas or Oil or Coal firing: Whether for a Gravity, Forced Air or Perimeter heating installation, you can simplify your buying with Moncrief because —there is a Moncrief unit for practically any heating order you desire to fill.

And concentrated buying is smart, profitable buying because —

- ... Your ordering is simplified
- ... Your warehousing is simplified
- ... Your selling is simplified

So . . . YOUR PROFITS ARE BIGGER!

So — concentrate with Moncrief, where you can get units with either cast iron or steel heating elements. Where oil fired furnaces are also gas fired furnaces, which carry the A.G.A. seal of approval. Where coal fired units are designed for efficient operation when converted to gas or oil firing with the Moncrief Conversion Burners.

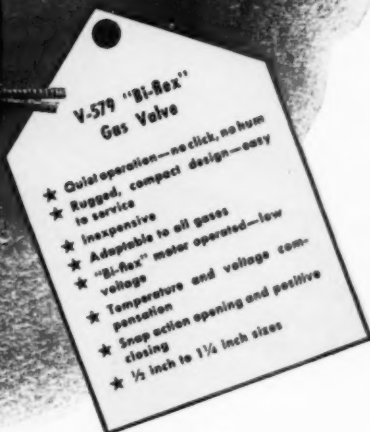
THE HENRY FURNACE COMPANY • Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF
SINCE 1892

FURNACE PIPE AND FITTINGS

demand **DETROIT CERTIFIED CONTROLS**



New Value for Users—New Profits for You From the Industry's Ablest Builder of Quality Controls!

The easiest thing in the world to sell is a good job at a low cost, and that's exactly what you can count on doing when you sell **DETROIT** Certified Controls. Why? Because **DETROIT** Controls are designed and built to fill your customers' needs—to give real economy and reliability through years of trouble-free service. And **DETROIT's** new V-579 "Bi-flex" Gas Valve is no exception. Loaded with sales appeal, the new V-579 gives users, at low cost, an exclusive

combination of outstanding features which provide new standards for the efficient and quiet operation of modern gas burning equipment. So insist that your source of supply furnish **DETROIT** Certified Controls with all your heating equipment—it will mean new value for your customers and assure new profits for you.

Write for Bulletin No. 229



No. 411 Thermostat—A sensitive and accurate Timed Cycling thermostat for all types of heating systems. Provides close control of room temperature. Attractively styled, easily installed and adjusted. Write for Bulletin No. 193 and Form No. 1545.

DETROIT

LUBRICATOR COMPANY

5900 TRUMBULL AVE., DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & Standard Sanitary corporation
Canadian Representatives: RAILWAY & ENGINEERING
SPECIALTIES, LTD.—Montreal, Toronto, Winnipeg



**DETROIT HEATING AND REFRIGERATION CONTROLS • ENGINE
SAFETY CONTROLS • FLOAT VALVES AND OIL BURNER EQUIP-
MENT • DETROIT EXPANSION VALVES AND REFRIGERATION
ACCESSORIES • STATIONARY AND LOCOMOTIVE LUBRICATORS**

Serving home and industry AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEMANE ROGERS • KOSI HEATSE • TOKAWANDA IRON

NIAGARA

BUYER'S GUIDE FOR SHEET METAL WORKERS

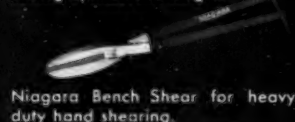
● The hand tools shown on this page are just a few of the hundreds of machines and tools which are helping sheet metal workers do better work with less effort and lower cost. Men who take pride in their work find there is economy in Niagara proven high quality. Niagara has been a *quality name* since 1879. Ask your dealer or write for information in regard to America's most complete line of machines and tools for plate and sheet metal work.



Niagara Extra Heavy Snips cut 16 gauge mild steel.



Niagara Double Cutting Shear for cutting cylinders to length.



Niagara Bench Shear for heavy duty hand shearing.



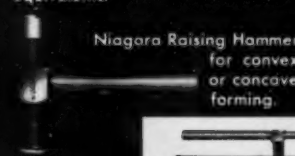
Niagara Bench Plate for rigidly mounting stakes, bench shears, etc.



Niagara Straight Edge for accurate layout work.



Niagara Circumference Rule graduated in inches and circumferential equivalents.



Niagara Raising Hammer for convex or concave forming.



Niagara Stakes made in a complete line of essential shapes and sizes.



Niagara Gutter Beaders designed for convenient operation.



Niagara Hand Seammers for finishing standing seams on roofing.



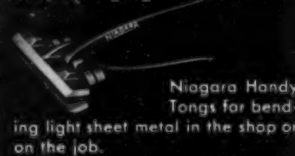
Niagara Hickory Mallets eliminate marring of material.



Niagara Wood Roofing Folder for light weight, low cost folding.



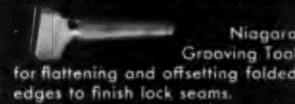
Niagara Pipe Crimper for thicknesses up to 22 gauge.



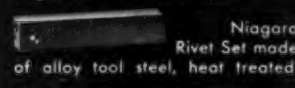
Niagara Handy Tongs for bending light sheet metal in the shop or on the job.



Niagara Hollow Punch for punching round holes in light sheet metal.



Niagara Grooving Tool for flattening and offsetting folded edges to finish lock seams.



Niagara Rivet Set made of alloy tool steel, heat treated.



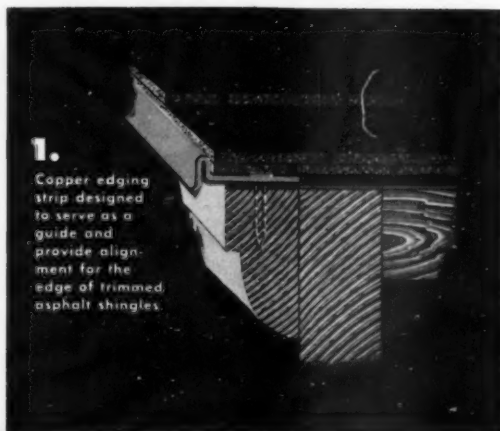
Niagara Riveting and Setting Hammers have forged steel heads, heat treated, polished and fastened to handle with steel wedges.



Using **Copper** wisely in **Building Design** and **Construction**

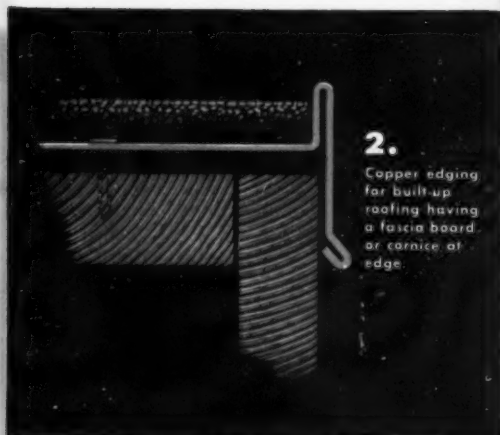
**WRITE FOR
DETAIL DRAWINGS**
(Numbered for A.I.A. Filing)

Details of the copper construction illustrated in this sketch are available in 8 1/2" x 11" sheets convenient for filing. Other sketches showing how a little copper can go a long way in achieving good building construction will be featured in subsequent advertisements.



1.

Copper edging strip designed to serve as a guide and provide alignment for the edge of trimmed asphalt shingles.



2.

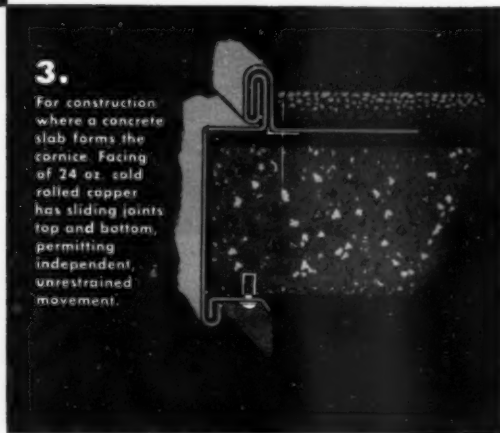
Copper edging for built-up roofing having a fascia board or cornice at edge.

roof edgings of **Copper**

Metal edgings which serve as gravel stops eliminate the need for more costly masonry construction. Copper is the preferred metal for roof edgings because of its lasting qualities, easy workability and weather-tight performance when properly installed. Sketches 2 and 3 suggest designs and method of installing. The edging strip shown in sketch 1 is for use on sloping roofs with asphalt shingles. For suggestions or counsel on any problem involving sheet copper write:

The American Brass Co., Waterbury 20, Conn. 1127

In Canada: Anaconda American Brass Ltd.,
New Toronto, Ontario.



3.

For construction where a concrete slab forms the cornice. Facing of 24 oz. sold rolled copper has sliding joints top and bottom, permitting independent, unrestrained movement.

nothing lasts like

ANACONDA[®]
COPPER

LUMBER DEALERS HEATING CONTRACTORS



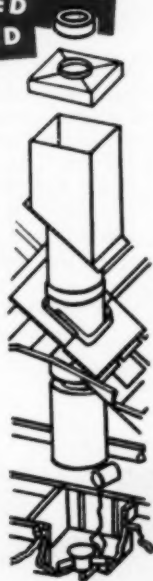
- HEATING SUPPLY JOBBERS
- BUILDING MATERIALS JOBBERS

These Van-Packer JOBBERS CAN SHIP PACKAGED CHIMNEYS NOW

**ACCEPTED
PROVED**

1. WASHINGTON, Vermorel Prod. Co.
2. JACKSONVILLE, Roger Kennedy
3. ATLANTA, Dealers Bap. Co.
4. CHICAGO, Alexander Warehouse & Sales Co.
5. JOLIET, Alexander Warehouse
7. URBANA, Alexander Warehouse
8. SPRINGFIELD, Alexander Warehouse
9. CHICAGO, Chicago Furnace Supply Co.
10. CHICAGO, Chicago Metal Manufacturing Co.
11. EAST ST. LOUIS, Midwest Wholesale Materials Co.
12. ELGIN, Valley Merc. Co.
13. MOLINE, Domestic Equipment Co.
14. PEORIA, Wilkins Pipe and Supply Co.
15. QUINCY, K & P Heat Co.
16. ROCKFORD, Matt Brothers
17. SPRINGFIELD, Peter Vredenburg Lumb. Co.
18. EVANSVILLE, American Radiator & Std. Bap. Corp.
19. FORT WAYNE, Tri-State Heating Supply Co.
20. GARY, G. W. Berkeimer Co.
21. INDIANAPOLIS, Central Supply Co.
22. INDIANAPOLIS, Indiana Dist. Co.
23. INDIANAPOLIS, Wright-Darwin Co.
24. SOUTH BEND, Great Lakes Dist. Corp.
25. FORT WAYNE, Great Lakes Dist. Corp. (Branch)
26. LOGANSPOUT, Great Lakes Dist. Corp. (Branch)
27. SIOUX CITY, Builders Wholesale Supply Co.
28. DES MOINES, Des Moines Furn. & Stove Rep. Co.
29. LOUISVILLE, Coleman Sales & Service
30. DEARBORN, Warm Air Heating Supply Co.
31. FERNDALE, McCaul Lumber & Coal Co.
32. GRAND RAPIDS, Evans & Rottler Lumber Co.
33. JACKSON, Central Michigan Building Supply, Inc.
34. SULTW, W. Edward Bell and Cement Co.
35. MINNEAPOLIS, Sago-Reese Co.
36. ST. PAUL, MacArthur Co.
37. KANSAS CITY, Kansas City Bldg. Bap. Co., Inc.
38. ST. LOUIS, Dealers Service & Supply Co.
39. OMAHA, U. E. McCotley
40. BUFFALO, Scheeler Warm Air Heat. Equip. Co.
41. FLORAL PARK, Home Crafts, Inc.
42. GRAND FORKS, Dinco Bldg. Bap. Co.
43. WILLISTON, Fastlad Lumber Co.
44. AARON, The Hardware & Supply Co.
45. CINCINNATI, Silverton Supply Co.
46. COLUMBUS, American Radiator & Std. Bap. Corp.
47. DAYTON, The Dayton Builders Supply Co.
48. TOLEDO, Adam Lost Co.
49. YOUNGSTOWN, Youngstown Bldg. Mat. & Fuel Co.
50. PORTLAND, Marver Steel Co., Inc.
51. PHILADELPHIA, Pierce-Phelps, Inc.
52. CHARLESTON, Van-Smith Building Material Co.
53. GREENVILLE, Wholesale Heat & Sheet Metal Sup. Piers, Schmitt Sheet Metal Shop
54. RAPID CITY, The Hunsdane Co.
55. SIOUX FALLS, W. G. Buckner Lumb. Co.
57. SALT LAKE CITY, Ashton Heat & Air Cond. Co.
58. MILWAUKEE, Wisconsin Iron & Coal Co.
59. OSHKOSH, Piskars Fuel & Supply Co.
60. POCAHONTO, Garrett 7th. Lines, Inc. (W'rob'as)
61. NEWARK, Van-Packer Corp. (Branch) (W'rob'as)
62. SEATTLE, Commercial Warehouse Co. (W'rob'as)
63. STEWART MANOR, P. G. Building Enterprises, Inc.
64. WATERLOO, Waterloo Heating Supply Co.
65. SOUTH BOSTON, Herriot Co.
66. RAY CITY, Alert Pipe & Supply Co.
67. DENVER, The Building Products Jobs, Inc.
68. CLEVELAND, Sharp Heating Supply Co.
69. OTTUMWA, Master Plumbers Supply Co.
70. SOUTHPORT, P. G. Building Enterprises, Inc.
71. ALASKA, FAIRBANKS, A. E. Waxberg Const. Co.
72. HAINES, Mr. P. B. Allen

Now Van-Packer Chimneys are available everywhere . . . without waiting. You'll find a Van-Packer jobber in your vicinity ready and able to give you immediate delivery and service. Powerful, full page, color advertising to builders presells Van-Packer to your customers. Over 75,000 Van-Packer Chimneys are now in use—proof of Van-Packer's acceptance among architects, home owners, builders and code officials.

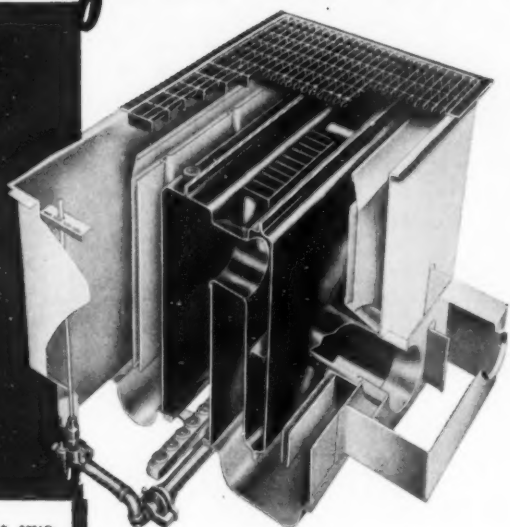


**Van-Packer
CORPORATION**
132 WEST ADAMS STREET
CHICAGO 3, ILLINOIS



FOR PROFITS Get in on the Ground Floor

WASHINGTON GAS FLOOR FURNACES



Producing as much as 50% more heat, yet two whole inches shallower than comparable units, the WASHINGTON Gas Floor Furnace has much to offer the retailer and contractor. It is installed easily in the floor of any building with or without a basement. Multiple installations can be used when heating requirements are higher. Automatic electric controls are available for all models.

WASHINGTON Gas Floor Furnaces are competitively priced, too. You can earn extra profits and extra customer good will by installing these dependable units. Be ready to offer the best . . . for new installations or quick, low-cost conversion...with WASHINGTON Gas Floor Furnaces, a product of Gray & Dudley Company, a respected name in heating appliances for almost 90 years. Use the coupon for complete information.

GRAY AND DUDLEY COMPANY

Established 1862
Nashville, Tennessee

Check These Features

- ★ Easy to Install
- ★ More Heat from Less Space
- ★ Extremely Trouble-Free
- ★ 35,000 to 70,000 BTU ratings
- ★ Three Sizes
- ★ AGA Approved for all gases

Please send me specifications and details on
WASHINGTON Gas Floor Furnaces. I am a

☐ Dealer

☐ Contractor

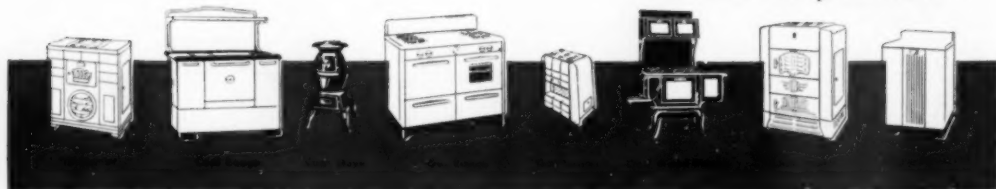
Name _____

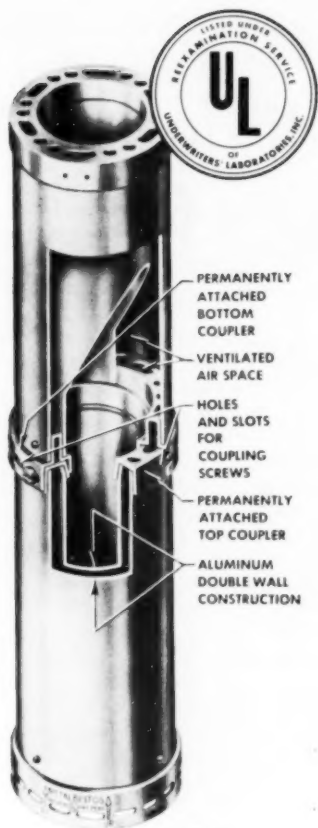
Firm _____

Address _____

City _____ State _____

The most complete line!





BE SURE OF SAFE VENTING WITH QC METALBESTOS

Improper venting of gas appliances always brings customer complaints and sometimes results in serious financial loss to contractors. Metalbestos' unique pipe-within-a-pipe construction assures safe, efficient venting. Precision made Quick-Couplings align pipe sections automatically and form a permanently gastight connection. Even when unskilled workers install foolproof Metalbestos, you know the job is right and will give years of trouble-free operation.

LOWER INSTALLATION COST

Made of corrosion-resistant, lightweight aluminum, Metalbestos is easy to handle, simple to install. Only 3 screws are needed to quickly connect pipe sections without using mastic, cement or banding material. No special tools are required. Adjustable lengths, adjustable elbows and other versatile fittings permit rapid assembly and eliminate expensive, time-consuming cutting and fitting.

NOW AVAILABLE!

A new manual, "Venting of Gas Appliances", is now ready for distribution. Published in the interests of better venting, this valuable booklet contains the important rules for venting gas appliances and other helpful information regarding good venting practices. Yours without charge — simply fill out coupon. No obligation.



METALBESTOS DIVISION

WILLIAM WALLACE COMPANY • BELMONT, CALIF.

METALBESTOS DIVISION Department #
WILLIAM WALLACE CO. • Belmont, California

Please send a copy of your new manual, "Venting of Gas Appliances."

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____



They still look for Quality first!

What with today's restrictions and uncertainties, you can bet that Mr. and Mrs. America will demand the *best* for their money in 1951. From hassocks to heating, they'll look first for *quality* in everything they buy.

And because Bryant automatic gas heating equipment is known for quality, it's the brand that will be asked for again and again this year. For Bryant equipment has the top-grade features of design, workmanship and performance that make for real customer satisfaction.

The Bryant Dealer stands to reap a golden harvest from the demands of Americans for quality heating. He draws all his equipment from a single source, deals with a distributor near him who backs him with aid in everything from engineering to sales.

In your neighborhood it could be *you*. Contact the Bryant Distributor nearest you or write direct, Bryant Heater Division, Dept. 172, Affiliated Gas Equipment, Inc., 17825 St. Clair Avenue, Cleveland 10, Ohio.



Your single source of supply for everything in gas heating equipment!



2-in-1 FAN and LIMIT CONTROL

saves on original cost, installation and wiring

FAN ACTION
THERMAL ELEMENT

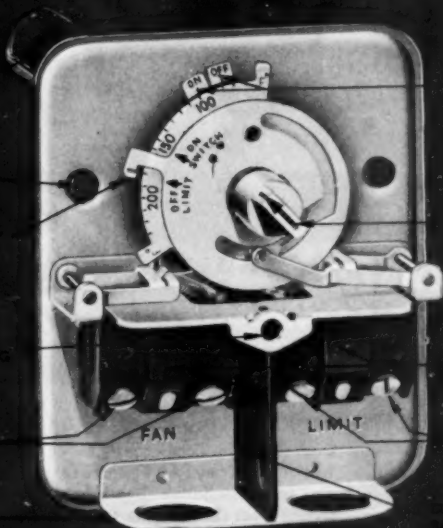
ADJUSTABLE
KNOB ON
SIDE

LIMIT CONTROL
ADJUSTMENT
ARM

RECESSED
CONDUIT
BOULDER
LEDS

TERMINAL
BLOCKS

COMMON
PLATES



FAN CONTROL
THERMAL
ELEMENT

ADJUSTABLE
KNOB

RECESSED
CONDUIT
BOULDER
LEADS

TERMINAL
BLOCKS

REPLACEMENT OR REFUND OF MONEY
Guaranteed by
Good Housekeeping
IF NOT AS ADVERTISED THEREIN

**Permits use of blower for continuous summer ventilation
...without disturbing winter adjustments!**

What a combination—one control does two jobs! It's a serviceman's dream come true—just one front screw holds cover... mounting holes are easy to get at... plenty of room for wiring, handy conduit knock-outs. Independent "fingertip" temperature settings for the fan and limit permit easy adaptation of control to each installation. Best of all, when external knob is turned by the home-owner for continuous summer ventilation, you don't have to go back and reset the fan and limit switches for winter use. It's typical of Perfex "Controls You Can Trust"—a reliable, long-lasting control designed with all modern

features to save time, trouble, and money for you and your customer. Get latest data on Perfex Controls for oil, gas and coal-firing from your nearby distributor, or write us.

PERFEX
CONTROLS YOU CAN TRUST

PERFEX CORPORATION, MILWAUKEE, WISCONSIN
In Canada, Perfex Controls Ltd., Toronto 1, Canada

AUTOMATIC TEMPERATURE CONTROLS • INDUSTRIAL ENGINE RADIATORS • COLOR PROCESS PRINTS

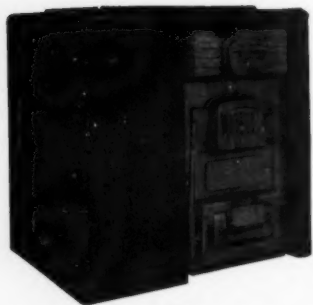


**MORE PEOPLE TO
HELP YOU**
(expanding distributor network)



**LESS SERVICING
FOR YOU**
(in the home)

Welcome to Booths
438, 439, 430
Q8 Heat Exposition
April 2-6



Triplife Flo-Warm
Furnace



Gas Forced Air
Flo-Warm Furnace

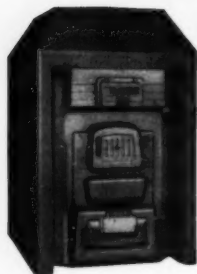


Oil De-luxe Flo-Warm
Furnace

THE WILLIAMSON HEATER COMPANY

*Complete
Line*

WARM AIR
HEATING
and WINTER
AIR CONDITIONING



Triplife Square Cased
Gravity Furnace



Gas, Oil, or Coal—there is a Williamson Warm Air Furnace for any size installation. Beautifully styled, built for life-time service, and designed for fuel economy, the models shown represent 60 years of research—and dealer satisfaction. For greater sales, easier installations, more enthusiastic customers and bigger profits investigate the Williamson Complete Line. Write for details—

THE WILLIAMSON HEATER COMPANY

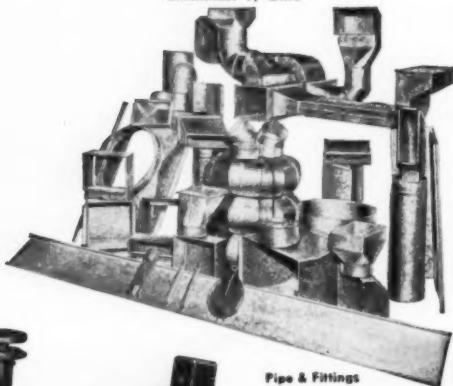
Dept. AA, 4558 Marburg Ave.
Cincinnati 9, Ohio



Triplife Round Cased
Gravity Furnace



Gas Gravity Furnace



Pipe & Fittings



Oil Hi-Bay Furnace



Gas Burner



Oil Burner



Stoker

YOU CAN'T HELP MAKING MONEY

If you sell one of these famous space heaters

ALLEN'S
 BARNES
 BEYER
 COLE HOT BLAST
 COLEMAN
 COLEMAN (Canada)
 CREST (Canada)
 CUSTOM-AIRE
 DUO-THERM
 ENTERPRISE
 ENTERPRISE (Canada)
 ESTATE-HEATROLA
 FINDLAY (Canada)
 FLORENCE
 H. C. LITTLE
 HERCO (Canada)
 INTERNATIONAL
 JUNGERS
 LACO
 LONERGAN
 MAGIC CHEF
 MONARCH
 MONARCH (Canada)
 MONOGRAM
 NESCO
 NORGE-HEAT
 PERFECTION
 PREWAY
 QUAKER
 SAFEWAY
 SIEGLER
 SILENT FLAME
 SUPERFLAME
 TORRIDAIRE
 WASHINGTON FRUGAL



PLUS ALL THE LUXURY OF AUTOMATIC HEAT—WITH LOW-COST, EASY TO SELL A-P COMFORT CONTROLS

Yes, if you sell one of the famous-make space or trailer heaters listed here you can offer every customer the luxury of true automatic, thermostatically controlled heat! This means easier selling, because you can offer comfort and convenience equal to the most expensive kind of heating, with no wasted heat — and substantial fuel savings!

What's more, this easy-to-sell comfort means ADDITIONAL PROFITS for you. Write now for Bulletin T-2 on A-P Comfort Controls.



EASY TO INSTALL

There's an A-P Electric or Mechanical Comfort Control actually engineered to fit these heaters. Just mount conversion top on present manual control; connect to thermostat and transformer. Mechanical thermostat even eliminates wiring!



DEPENDABLE Controls

Famous for completely reliable service . . . in oil heating . . . gas heating . . . refrigeration.

A-P CONTROLS CORPORATION

(formerly Automatic Products Company)

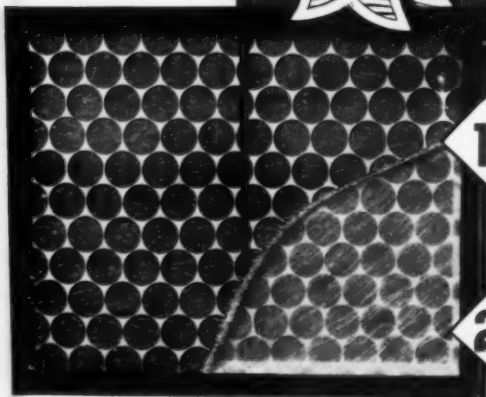
2452 N. Thirty-second Street • Milwaukee 45, Wisconsin • In Canada: A-P Controls Corporation, Ltd., • Cooksville, Ontario

DUST IS OUT BECAUSE IT'S IN*

The NEW IMPROVED

 *Glasfloss*

AIR FILTER



1

THE STANDARD HIGH EFFICIENCY
GLASFLOSS AIR FILTER PAD . . .

PLUS

2

GLASFLOSS STRAINER MAT THAT MAKES DUST
FILTERING UP TO 98% EFFICIENT!



Dust is OUT of the air because it's permanently trapped IN the new, improved Glasfloss COMBINATION IMPINGEMENT-STRAINER TYPE AIR FILTER. Higher efficiency factor of 95% to 98%. Resistance, normal.

To the famous, long fine glass fibres of the standard Glasfloss unit has been added our exclusive STRAINER MAT feature. Combined, these two elements excel for dust and dirt air filtering. The improved Glasfloss IMPINGEMENT-STRAINER AIR FILTERS are available in 2" thicknesses—in all standard

sizes. They broaden your sales opportunity because they are ideal for paint-spray booths in automotive, aircraft and enameling operations; for food processing plants; pharmaceutical and soap manufacturers; television studios; restaurants and dining rooms; hospitals, schools and all public buildings—anywhere in the business and industrial world and where clean air is important. Increased profits, more satisfied customers are the plus values you can expect from Glasfloss IMPINGEMENT-STRAINER Air Filters. Write today for complete information. Address Dept. AA-2.

Glasfloss

155 EAST 44th STREET, NEW YORK 17, N. Y.

THE MOST *Attractive Salesman* I EVER MET..

How would you like
to meet the world's
most attractive
salesman?

and the sellingest one too!

And how would you like to have him working for you —
doing his stuff *right in your own showroom?*

Who is he?

He's the MOR-SUN Furnace — the most beautiful, most efficient furnace ever designed and built . . . the only furnace that

Sells on sight!

This salesman's got a sleek die-stamped casing — a heat exchanger made of heavy-gauge pressed *premium steel* — *deep drawing steel* — welded into one gas-tight unit . . .

And he's got a sales promotion and merchandising program to back up that beauty and that efficiency . . .

Want to meet him?

Then write us — we'll arrange it!

MOR-SUN Pressed Steel Forced Air and
Gravity FURNACES for GAS and OIL!



"Sells on Sight"

MOR-SUN
FURNACE DIVISION

MORRISON
STEEL PRODUCTS, INC.

625 AMHERST ST.
BUFFALO 7, N. Y.

Health authorities warn against danger of "up-and-down" heat!

**Anthracite heat is economical,
healthier, safer, more comfortable
—and automatic anthracite
heat pays for itself
in a few years.**

Every winter many families suffer discomfort, colds and other winter illnesses as a result of **"up-and-down"** heat from non-solid, so-called "modern" fuels. Here's what happens. The thermostat shuts off the flow of heat **completely**. The warm air rises to the ceiling. Cold areas and drafts are created in the lower part of the rooms!

Your customers don't get **"up-and-down"** heat with hard coal. Heat with modern fully automatic hard coal equipment is thermostatically controlled—but the fire is never completely "off."

Big savings! With modern automatic hard-coal equipment your customers get the **convenience** of automatic heating and, because they burn the cheaper sizes of hard coal, they save as much as half of their present fuel bill! And . . . if they have hand-fired equipment, they can still cut their fuel bill as much as 20% just by adding an inexpensive thermostat.

For full information on **modern automatic hard-coal heating** write Anthracite Institute, 101 Park Avenue, New York 17, N. Y.



**Your customers can save up to \$50 to \$125 a year on fuel
with this automatic anthracite heating equipment.**



◀ **ANTHRAFLO** . . . A low-priced, efficient boiler-burner unit. Compact. Feeds self from fuel bin. Rugged, simple construction. Completely automatic, silent, clean. **Provides year-round hot water.** (Furnace-burner units for warm air systems also available.)

MODERN HARD-COAL STOKERS . . . specially designed complete boiler-burner units (such as Motor Stoker, Electric Furnaceman and others), offer high efficiency, are smaller in size and greater in economy of operation. Completely automatic from bin feed to ash removal. Stoker automatically feeds the coal and removes the ashes. **Provides year-round hot water.** (Furnace-burner units for warm air systems also available.) Modern conversion stokers can be quickly installed in present boiler or furnace.



◀ **ANTHRATUBE** . . . A complete boiler-burner unit with induced draft. Delivers maximum heat with hard coal. Compact. Completely automatic from coal bin to ash removal. Highly efficient combustion. **Provides year-round hot water.**



ANTHRACITE INSTITUTE

101 Park Avenue

New York 17, N. Y.

Men who know ducts **INSIDE...**

ULTRALITE DUCT LINER—ACOUSTICAL

This is the duct liner that **won't burn!**—a flexible, resilient, semi-rigid glass fiber insulation designed specifically as acoustical duct liner. Has excellent sound absorbing properties, particularly at the irritating noise levels. Won't break, flake or chip. Runs quickly around curves and corners. Friction loss is low. Won't delaminate under air movement; won't flake off in air stream.

ULTRALITE DUCT INSULATION and DUCT LINER

have every characteristic that makes application easy and quick. They're light, flexible, resilient; you can cut them with a knife; run them quickly around curves and corners; adhere them to metal with adhesives . . . screws and washers . . . wires! Get full details on Ultralite and learn why it goes on faster, easier and cheaper than any insulation you've ever used!

ULTRALITE DUCT INSULATION—THERMAL

A soft, resilient, flexible insulation of long, fine glass fibers with a low K-factor. Available plain or with your choice of 4 vapor barrier facings, already adhered to the insulation. Wrap-around method of application cuts applied costs way down. Non-irritating, pleasant to handle. Fire-resistant, non-corrosive to metals.



..and OUT..



...use **ULTRALITE** throughout!

WRITE TODAY for free samples and catalog A.I.A. File No. 37-D-2 or consult Sweet's File Architectural



GUSTIN-BACON MFG. CO.

1412 WEST 12TH ST., KANSAS CITY, MO.

New York Chicago Philadelphia San Francisco Los Angeles
Houston Tulsa Ft. Worth

AMERICAN ARTISAN, MARCH, 1951

Please send me samples of **ULTRALITE** and catalog A.I.A. File No. 37-D-2. AA-3

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

"CANTON, OHIO JOBBERS AND DEALERS AGREE ...

Viking Blower Advanced Design Means

... EASIER-SPEEDIER INSTALLATION

... Greater Profits!"



says TOM McINTYRE, Viking Salesman

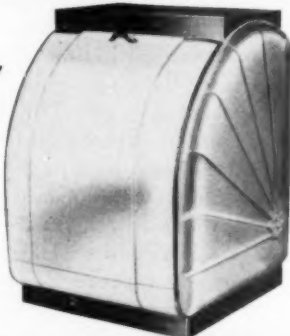
The Dealers We Serve are Quality Conscious

They DEMAND VIKING BLOWERS"



says EMIL (TONY) OEFFINGER,
Vice President, Grant Totten Company,
1215-19 McKinley Ave., S. W., Canton, Ohio

"In Canton's highly competitive heating field, you've got to handle the best in order to profit. That's why we handle Viking Blower Packages — why our dealers demand Viking Blowers. Once we've shown a dealer that Viking's exclusive features mean an easier selling job, a faster installation job, he's sold on Viking quality."



See What These Aggressive Canton Dealers Say About Viking Blowers:

PAUL CUNNINGHAM, Crystal Pk. Furnace Co.,
806 12th Street, N. E., Canton, Ohio

"When the orders come piling in, I really appreciate that snap-out filter ledge which makes the entire cabinet interior accessible on the Viking Blower. Only one man is needed to position the cabinet and set in the assembly. That means greater profit on every Viking job — more manpower available for other jobs."



IRV FRISCH, Niagara Heating,
1132 Cleveland, S. W., Canton, Ohio

"I appreciate the Viking Blower's saleable features. They do a nearly complete selling job themselves. Features like the larger oil cup that contains an entire season's lubricant and the spring thrust takeup, that eliminates all possible rattle from blower wheel, mean vastly fewer call-backs and more profits per installation."



H. C. FRAVEL, H. C. Fravel Company,
437 McKinley Ave., N. W., Canton, Ohio

"Because of that motor mount assembly I do most of the installation work out in the open. I do the job faster — without straining my back and skinning my knuckles. The time saved means money in my pocket."

Viking

AIR CONDITIONING CORP.
5601 Walworth, Cleveland 2, O.



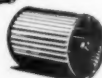
FANS



BLOWER ASSEMBLIES



HUMIDIFIERS



BLOWER WHEELS



PACKAGE BLOWERS

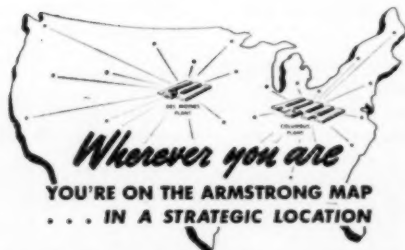


ARMSTRONG'S **complete furnace line gives you**

a chance at every prospect

There's no reason for evasion or substitution—which so often results in the loss of a sale—when you talk to a prospect with the Armstrong line at your command.

What he wants you've got! But how can you, without a back-breaking inventory? Armstrong has the answer for that, too. You carry just a few furnaces—the fast-movers. You sell others with the brand-new Armstrong Presentation Book, which carries a straight-forward, simple, logical sales story on all fuels, all models. You can do it without worrying about cross-country shipment of the furnace you sell; your nearby jobber's inventory is yours, without the investment. The inventory's at your back door, but the money's in your pocket. Certainly, if you want a full line—all the advantages of a full line—you want Armstrong. Drop us a line today. Now is the time for action!



Armstrong's two huge plants serve both sides of the continent quickly, economically. A warehousing distributor, with a complete Armstrong inventory, is within a stone's throw of everywhere. Wherever you are, Armstrong's distribution system is set up to serve you. It's better, quicker, more profitable . . . for you.



Please address Dept. AA at our plant nearest you

Warm-Air Furnaces—Gas, Oil, Coal—A Complete Line

FOR Hard-to-Start Jobs

Requiring Low Starting Current

SPECIFY

Century

TYPE RS*

MOTORS



* Single Phase, Repulsion Start, Induction, Brush Lifting Motors

Century Electric Company is celebrating its 50th year in the electrical industry.

Century SERVICE

Is Near Any CENTURY Motor Driven Equipment

Satisfactory performance of CENTURY products is assured by more than 200 CENTURY Authorized Service Stations supervised by 28 CENTURY Sales Offices.

1. Facilities for immediate exchange of most CENTURY standard ratings of standard construction are available at CENTURY Authorized Service Stations.
2. CENTURY Authorized Service Stations are qualified and equipped to service and repair any piece of CENTURY apparatus.
3. Genuine CENTURY renewal parts are available at CENTURY Service Stations, CENTURY Parts Distributors and at the factory in St. Louis.

You will find that these rugged, dependable motors meet the starting, accelerating and running characteristics of such equipment as refrigeration compressors, air compressors, stokers, reciprocating pumps, and other hard-to-start loads.

For more than 47 years, Century Type RS motors have given satisfactory service throughout the world. They are available in sizes from $\frac{1}{2}$ to 20 horsepower, in drip proof and splash proof frames.

In addition, Century builds electric motors in a wide range of types and kinds—in sizes from $\frac{1}{6}$ to 400 horsepower for operation on single and polyphase for single and polyphase and direct current. Specify Century motors for all your electric power requirements.



CENTURY ELECTRIC COMPANY

1806 Pine St., St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

ALTERNATING CURRENT MOTORS POLYPHASE

Squirrel Cage Induction— $\frac{1}{6}$ to 400 H.P.
Wound Rotor Motors—1 to 400 H.P.
Synchronous Motors—20 to 250 H.P.

SINGLE PHASE

Split Phase Induction— $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$ H.P.
Capacitor— $\frac{1}{6}$ to 20 H.P.
Repulsion Start, Brush Lifting, Induction— $\frac{1}{2}$ to 20 H.P.

DIRECT CURRENT MOTORS

$\frac{1}{6}$ to 300 H.P.

GENERATORS

AC, 63 to 250 KVA
DC, 75 to 200 KW

GEAR MOTORS

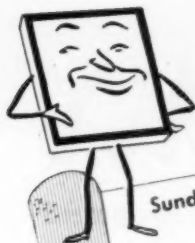
$\frac{1}{8}$ to $1\frac{1}{2}$ H.P.

MOTOR GENERATOR SETS

AC to DC, AC to AC
DC to DC, DC to AC

Open Protected, Splash Proof, Totally Enclosed
Fan Cooled, Explosion Proof.

Ball Bearing motors are factory lubricated for several years' normal service. Bearing housing construction permits easy re-lubrication when unusual service demands it.



Diary of a Dirty Filter

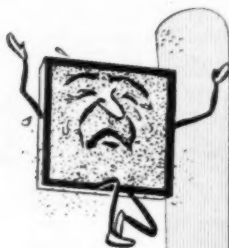
Sunday, October 1st

Starting life today with clean face and good intentions.



Monday, January 1st

Now so dirty I am beginning to make it hard for the furnace blower.



Thursday, February 1st

Boy, I'm really dirty now! Hard for air to get through. Innocent furnace blamed for lack of heat. I need replacement...fast!

Urge your customers to replace dirty filters regularly with new AMER-glas Filters. Inexpensive. Clean to handle, no prickly slivers. AMER-glas is the filter for satisfied customers... a new source of regular profit to you.

AMER-glas to the rescue!



AAC

An Engineered product of
American Air Filter
COMPANY, INC.

*make us
PROVE IT!*

AMERICAN AIR FILTER CO., INC.
355 Central Ave., Louisville 8, Ky.

Please send me complete information on AMER-glas Replaceable Air Filters. Show me proof of the profits!

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



CENTURY

**Automatic Heating Equipment
can make money for
you every day!**

44 CENTURY Units
help you close more sales!

It has been pretty well established that a heating dealer who sells from a **complete line**, closes more sales and shows a larger net profit at the end of the year. Century specializes in fully automatic heating equipment and offers 44 units that will enable an alert heating dealer to bid on the profitable automatic heating installations in the residential and commercial field.

Century Automatic Heating Equipment has a reputation for greater efficiency, dependability and lowered fuel costs that is of deep interest to every prospective purchaser. Century's reputation is the outgrowth of 26 years of service in automatic heating.

Century Engineering Corporation, Cedar Rapids, Iowa



6 Sizes Oil HIBOYS
85-380 M/ B. T. U.'s



4 Sizes Gas HIBOYS
85-150 M/ B. T. U.'s



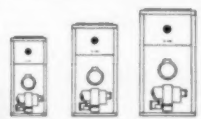
3 Sizes Oil Gravity
70-140 M/ B. T. U.'s



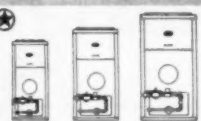
3 Sizes Gas Gravity
70-140 M/ B. T. U.'s



6 Sizes Oil (Basement)
105-380 M/ B.T.U.'s



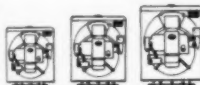
3 Sizes Oil (Basement)
100-170 M/ B.T.U.'s



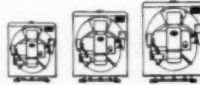
3 Sizes Gas (Basement)
100-170 M/ B.T.U.'s



2 Sizes Oil Vaporizing
60-80 M/ B. T. U.'s



3 Sizes Oil Boilers 380-740
Sq. Ft. Radiation



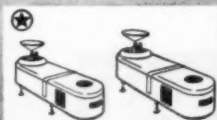
3 Sizes Oil Water Heaters
125-250 G. P. H.



4 Sizes: 3/4-5 G.P.H.
Conversion Oil Burners



2 Sizes: 5-20 G.P.H.
Conversion Oil Burners



2 Sizes: 87-250 M/ B.T.U.'s
Conversion Gas Burners

WRITE TODAY!

Some choice territories are open — let us tell you how you can build greater profits with an exclusive Century franchise.

CENTURY

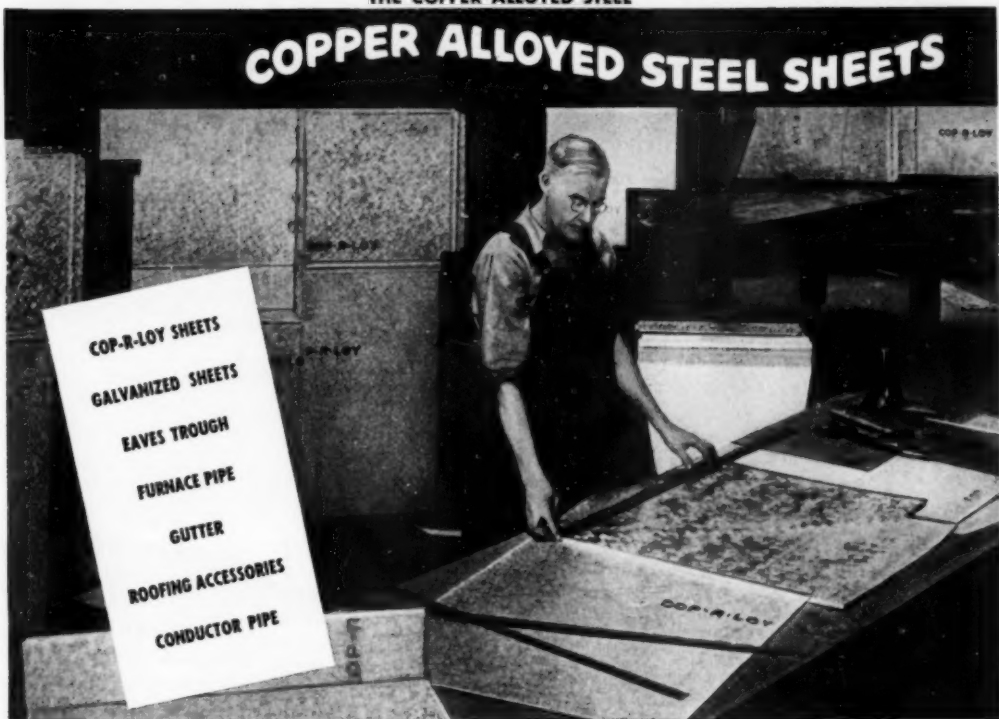
The Finest in Automatic Heating Equipment.

NO ONE BUT WHEELING MAKES

COP-R-LOY

REG. U. S. PAT. OFF.
THE COPPER ALLOYED STEEL

COPPER ALLOYED STEEL SHEETS



COP-R-LOY SHEETS
GALVANIZED SHEETS
EAVES TROUGH
FURNACE PIPE
GUTTER
ROOFING ACCESSORIES
CONDUCTOR PIPE

For more than 40 years, wise users of galvanized sheets have looked to Wheeling for the finest in copper alloyed steel. And in Wheeling Cop-R-Loy they have consistently found the

sheet that's worthy of their finest work—sheet that's *doubly* protected: by Wheeling's Cop-R-Loy formula in the base metal, and by Wheeling's galvanizing, two Wheeling features that work as a team to give you your best value. For easy working—lasting work—always specify Wheeling Cop-R-Loy Sheets.

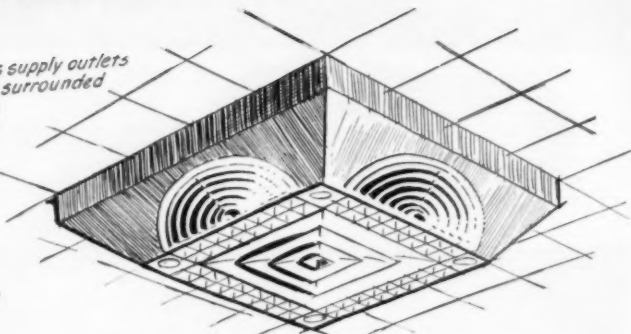


WHEELING CORRUGATING COMPANY
WHEELING, WEST VIRGINIA

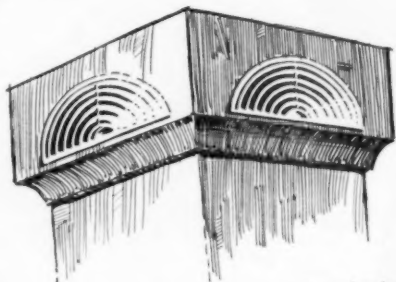
ATLANTA • BOSTON • BUFFALO • CHICAGO • COLUMBUS • DETROIT • KANSAS CITY • LOUISVILLE
MINNEAPOLIS • NEW ORLEANS • NEW YORK • PHILADELPHIA • RICHMOND • ST. LOUIS

ideas for using ANEMOSTAT AIR DIFFUSERS

*Type W Anemostats as supply outlets
Type E for return air is surrounded
by narrow egg crate
fluorescent fixtures*



*Two Type W's at side of
proscenium arch for auditorium
or theatre installation*



*Type W's used at top of column
which conceals air duct*

*Remember - pattern control can easily
be obtained with standard Anemostat
Air Diffusers*

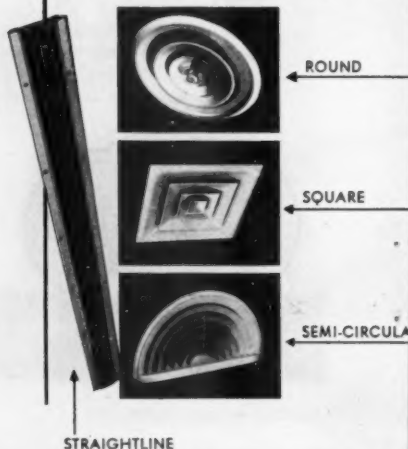
Anemostat Air Diffusers offer unlimited design possibilities. They can be used in regular, acoustical and egg crate ceilings . . . combined with all types of lighting fixtures . . . in commercial, industrial and home applications. Anemostat Air Diffusers provide uniform diffusion throughout the entire conditioned area. They eliminate harmful drafts, stale air pockets and equalize temperature and humidity. New Selection Manual contains complete application and specification data. Write for your copy.

"No air conditioning system is better than its air distribution"

ANEMOSTAT®
DRAFTLESS Aspirating AIR DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA, 10 EAST 39th STREET, NEW YORK 16, N. Y.
REPRESENTATIVES IN PRINCIPAL CITIES

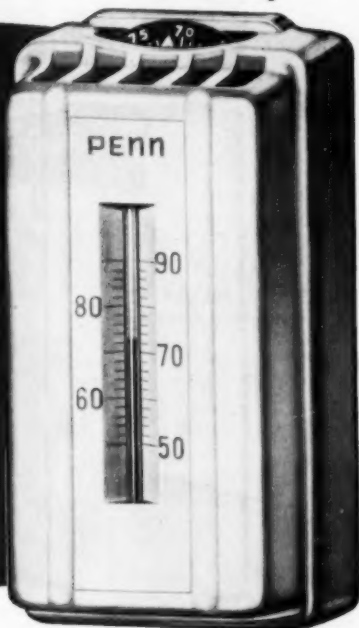
ANEMOSTAT offers maximum design possibilities because only Anemostat Air Diffusers come in all these shapes



*some call it "New..."
some call it "Magic"*

PENN CALLED IT **HEAT ANTICIPATION**

17 YEARS AGO
and it's still tops
on every type of
heating system with
every kind of fuel

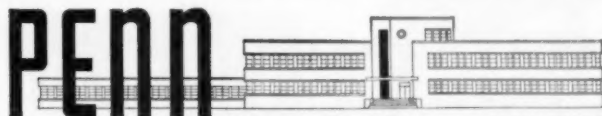


Don't settle for less... use PENN Controls on your next heating job... they cost no more! **Penn Electric Switch Co., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N. Y., U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ontario.

**Here's What Penn
Heat Anticipation
Does...**

- * Holds the temperature within one-half degree of selected level.
- * Avoids "cold 70"; ends discomfort of "zig zag" heating.
- * Automatically compensates for outside weather conditions.
- * Provides more frequent, short burner operations instead of longer runs and standby periods, assuring even flow of warmth for greater comfort and fuel economy.

It "hugs" the selected level for closer temperature control



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

THE TREND TO LOW PRESSURE



GROWS! and



GROWS! and



GROWS!

OIL-O-MATIC
Trade Magazine Ad
March 1949

**LEADERSHIP
IS ALWAYS LOVESOME**

After 30 years of leadership in low pressure technology...

Check the 9625

LOW PRESSURE PRINCIPLE!



Proof of **OIL-O-MATIC** Engineering Leadership



OIL-O-MATIC
Trade Magazine Ad
February 1949

WILLIAMS OIL-O-MATIC



See us at the
**OIL HEAT
INSTITUTE
National
EXPOSITION**
April 2-6, 1951
Navy Pier—Chicago
**SPACE 228,
229, 328, 329**

For OIL-O-MATIC FRANCHISE information, write
WILLIAMS OIL-O-MATIC DIVISION
Eureka Williams Corporation
Bloomington, Illinois

Over 30 years ago, Oil-O-Matic originated the Low Pressure Principle.

Many years later, others in the home heating field had the foresight to follow Oil-O-Matic's leadership.

Two years ago we welcomed these new-comers (through the two ads reproduced here) because we knew that the entire industry would benefit... that, indeed, the future of the industry could very well lie with Low Pressure's superiority in burning oil with efficiency and economy.

We pointed out then that Low Pressure sales were ahead of the field in rate of gain... nearly twice their pre-war record.

Today... the sale of Low Pressure oil burners is more than double the pre-war percentage!

We predict Low Pressure will continue to accelerate its gains in acceptance in the years to come.

And we predict that the OIL-O-MATIC DEALER—backed by Oil-O-Matic's 30 years of rich experience in engineering, manufacturing and selling Low Pressure—will not only maintain his leadership... but increase it!

That's why, now more than ever, Oil-O-Matic Dealers have the industry's best franchise.

THE REVOLUTIONARY NEW

Model Fifty-Ten

LOW PRESSURE OIL BURNER

The Greatest Advance in Oil Heat History

*There is a **BIG** difference in Oil Burners!*

OIL-O-MATIC



What you can do to make the supply of Stainless Steel
go further



Tell your supplier exactly where you'll use Stainless and how you'll fabricate it

Keep these points in mind, too, when you order Stainless

Minimize your scrap losses by ordering alternate multiple sizes that will cut to best advantage, and that will allow the mill to utilize the maximum amount of good material.

Indicate, if possible, acceptable alternates in composition, gage, size and finish.

"Second guessing" and "trial-and-error" specification of Stainless Steel are out of the question today with this vital material in such restricted supply. It's up to you to do everything possible to get the right Stainless and then use it right.

Your supplier—no matter who he is—can give you valuable help in this matter. He knows the advantages and the limitations of the various Stainless grades. And, since the supply picture varies from grade to grade, he may be able to suggest an alternate composition that will speed up delivery and give equally good or better results.

Your supplier knows the fabricating characteristics of Stainless grades, too. Consequently, he may be able to suggest slight changes in your fabricating procedure that will speed up or simplify production. In other words, the better he understands your problem the better able he is to give you the Stainless that will do the best job for you with the least trouble and delay.

So give your supplier all the facts. And don't forget to include a definite date for delivery . . . the date when you actually plan to use the material. It will help to distribute supplies as equitably as possible.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND • COLUMBIA STEEL COMPANY, SAN FRANCISCO

NATIONAL TUBE COMPANY, PITTSBURGH • TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM • UNITED STATES STEEL COMPANY, PITTSBURGH

UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK



U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

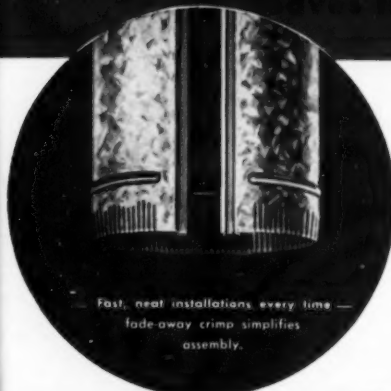


**The galvanized
furnace pipe that
locks automatically**



--MILCOR* LOCK JOINT

Saves time, cuts cost—for extra profits!



- Continuous lock over entire length of pipe
- Easy to assemble — no tools necessary
- Deep fade-away crimp
- Perfect fit end on end

New Milcor LockJoint Furnace Pipe will help to make your jobs more profitable. Installation is simplified and speeded up. Men can spend more time on the job, less time in the shop, because LockJoint can be assembled right on the job without mallet or stake. That's why LockJoint has become first choice with furnace men today.

Under today's emergency conditions, most furnace men are checking on the availability of Milcor Products *before* figuring jobs. Milcor Products are being produced and delivered as fast as possible, but to avoid delivery disappointments we are suggesting that you consult our branch in your district regarding all possible future delivery dates.

*Reg. U. S. Pat. Off.



Formerly Milcor Steel Company
MILWAUKEE 1, WISCONSIN

Baltimore 24, Md. • Buffalo 11, N. Y. • Chicago 9, Ill. • Cincinnati 25, Ohio
Cleveland 14, Ohio • Detroit 2, Mich. • Kansas City 8, Mo. • Los Angeles 23, Calif.
New York 22, N. Y. • Rochester 9, N. Y. • St. Louis 10, Mo.

Free

Complete Catalog on
Milcor Furnace Pipe
and Fittings. Tear out
the coupon and mail
today!

Inland Steel Products Co.,
4023 W. Burnham St., Milwaukee 1, Wis.

Please send me complete details on Milcor LockJoint Furnace Pipe.

Name.....

Company.....

Company Address.....

City..... () State.....

News Round-Up



January Housing Starts

HOMEBUILDING CONTINUED at a brisk pace in January, with 87,000 new permanent nonfarm dwelling units started, according to preliminary estimates of the Labor Department's Bureau of Labor Statistics. The January housing starts figure, while 8 per cent below that for December, was at an all-time high for the month of January.

The December-January decline was due entirely to a drop in public housing. Privately owned new housing starts rose by 5 per cent. Almost 81,000 units were put under construction by private builders last month, exceeding by 8 per cent the previous January high set in 1950.

The bureau pointed out that many builders still have a large backlog of commitments for housing that can be sold under pre-Regulation X credit terms. The unseasonally large volume of private housing started may also be partly explained by considerable anticipatory building and buying in housing as in other fields, partly in an effort to beat the March 1 deadline prohibiting the use of certain materials in civilian production, and partly due to uneasiness about further materials restrictions and more drastic credit curbs. Consequently, prospective buyers who were planning to purchase new homes at some future time may now be coming into the housing market with sufficient cash to meet Regulation X requirements.

SMA Officers

AT THE ANNUAL MEETING of the Midwest Stoker Association held in Chicago on February 7th, P. I. Bohmann, regional manager, U. S. Machine Corp., Chicago, was elected president of the association for the ensuing year. Mr. Bohmann succeeds F. H. Herndon, president, Herndon Sales & Service Co. For the past year Mr. Bohmann served as vice president of the association. Other officers of the association elected are as follows: E. J. Worley, vice president and E. M. May, secretary-treasurer. Mr. Worley is head of Stoker Service Co., and Mr. May is Chicago branch manager, Steel Products Engineering Co.

These three officers were also elected directors together with the following members who will serve as directors for the ensuing year: J. J. Hayes Auburn Stoker Co., and Jos. J. Zang, vice president, Herndon Sales & Service Co.

The following chairmen of the association's standing committees were named for 1951: Engineering — E. M. May, manager, Chicago branch, Steel Products Engineering Co.; and Labor Relations, E. W. Jones, Iron Fireman Mfg. Co.

Leslie R. Taylor

LESLIE R. TAYLOR, 60, president of International Heater Co. died following a heart attack at his home in Utica, New York on January 27.

He was born March 22, 1890 in Kansas City. After graduation from the James Millikin University, Decatur, Illinois, he became associated with the Thomas B. Jeffrey Co. in Kenosha, Wisconsin, makers of the Rambler and later the Jeffrey motor cars.

Mr. Taylor was with International Heater for 38 years — his first 23 years being spent in sales work out of the Chicago office. In 1928 he went to Utica as vice president in charge of sales. For the past four years he had been president of the company.

For many years he had been very active in all phases of the heating industry — in 1938 and 1939 he was president of the National Warm Air Heating and Air Conditioning Association, of which he had been a director for several years.

During World War II Mr. Taylor was consultant to the War Production Board's warm air furnace sub-committee in the Plumbing and Heating Division.

Aluminum Production — 1950

"THE U. S. ALUMINUM INDUSTRY produced 19 per cent more primary metal during 1950 than in the previous year," said Donald M. White, secretary of the Aluminum Association, in announcing final production figures for the year. "Primary production during the final quarter was 382,176,940 pounds to bring the year's total to 1,437,255,518 pounds."

"Production continues to rise" Mr. White reported, "and announced plans provide for increasing the industry's capacity by come 20 per cent this year, and for further increases in 1952. But most of the metal so produced will be earmarked for defense orders or the national stockpile."

"Shipments of sheet and plate by member companies of the association (about 98 per cent of the U. S. total) last year increased 48 per cent," Mr. White reported. "The total for 1950 was 1,155,318,982 pounds."



News Round-Up

REMA Meeting

R. H. ISRAEL, president of the Refrigeration Equipment Manufacturers Association, has announced that the month of April has been designated as National Refrigeration Safety Month.

"Our Association is wholeheartedly in support of a safety movement in the refrigeration industry, and we are glad to cooperate with the National Safety Council, the Refrigeration Service Engineers Society, and other organizations in focusing attention upon the safety factor in the manufacture operation, and repair or service of all refrigeration and air conditioning equipment," Mr. Israel said.

One of the features of the month will be a safety display at the 1951 Eastern Refrigeration and Air Conditioning Exhibit and Conference sponsored by the Refrigeration Equipment Manufacturers Association being held at the Hotel Statler in Buffalo, New York, on April 6, 7, and 8, 1951.

The Safety Program of the Refrigeration Service Engineers Society in the state of Ohio, under the direction of George J. Schuld, Jr., of Cleveland, Ohio, has been outstanding, reducing the accident frequency rate to below half of that which is common to the industry at present. By doing this they have reduced the workmen's compensation insurance premium rate in that state by 50 per cent.

FPC Authorization

THE FEDERAL POWER COMMISSION has granted proposals of New York State Natural Gas Corp., of New York City, and Niagara Mohawk Power Corp., of Syracuse, N. Y., involving natural gas service to Watertown and other communities in northeastern New York state.

New York State Natural was authorized to make additional sales of gas to Niagara Mohawk, which in turn received authorization to build a 55-mile, 10-3/4-in. pipeline from Fulton, N. Y., to Watertown. Estimated cost of Niagara Mohawk's project is \$1,991,000.

The authorization will enable Niagara Mohawk to convert its present manufactured gas territory in Watertown to straight natural gas service. In addition, Niagara Mohawk will provide straight natural gas along the route of the new line in the towns of Mexico, Pulaski, Mannsville, Adams, Adams Center, Sandy Creek and Lacona.

Construction Activity in 1950

A RECORD VOLUME of new construction work was accomplished in 1950, the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Division of the U. S. Department of Commerce reported jointly. Outlays for new construction put in place amounted to a record-breaking total of almost \$27-3/4 billion, the number of new housing units started far surpassed any previous year's total, employment in contract construction reached an all-time peak, and output of many building materials broke all previous records.

Homebuilding held the spotlight in 1950 and accounted for most of the new records in the construction field. The housing boom which had begun in the last half of 1949 reached unprecedented proportions in the spring of 1950 and continued to exceed all previous levels until near the end of the year. Liberal financing coupled with an accumulated backlog of housing needs set off the boom, and a tightening of housing credit brought it to an end in the fourth quarter of 1950. A total of nearly \$11-1/2 billion was spent on construction of privately owned nonfarm dwellings in 1950, or more than two-fifths of total outlays for all types of construction.

Construction of schools, churches, hospitals and other institutional buildings, both private and public, also achieved peak levels in 1950, and expenditures for highway construction and reclamation and flood control rose moderately over 1949 to a new high.

At year-end, a different pattern of construction activity was beginning to develop, partly as a result of actions taken to prevent inflation and to conserve materials that will be needed for defense purposes, and partly in anticipation of similar further actions that may become necessary. While home building was declining from record levels, factory, warehouse, and store building increased markedly after the outbreak of war in Korea. The immediate postwar expansion of industrial plants had been largely completed by 1949 and construction of new factories was proceeding at a relatively moderate pace until mid-1950 when many industrial establishments decided upon further expansion. Commercial building had lagged behind new residential developments in spite of substantial postwar expansion. A considerable increase in the construction of new stores, warehouses, and office buildings was under way, however, during the closing months of 1950.

(Please turn to page 66)

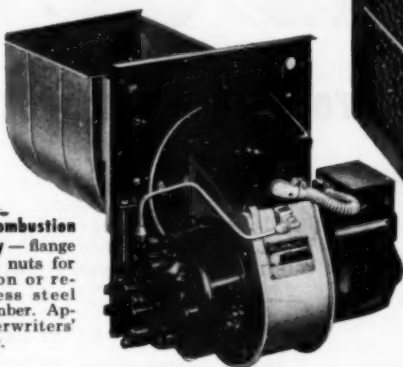
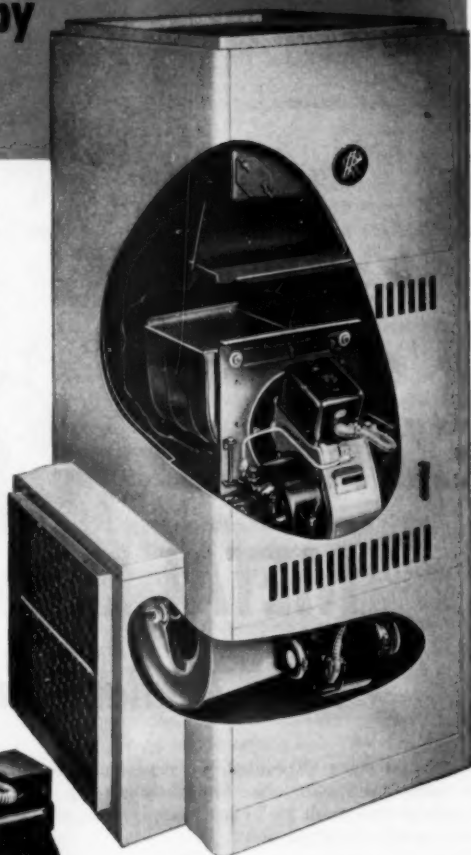
NEW! Vertical Steel—Oil-Fired Winter Air Conditioner by RICHMOND

Here's a new and wanted addition to Richmond's line of winter air conditioners... giving you a still wider selection of quality heating units.

Here's a unit built to fit easily into homes where space is tight... ideal for restricted space use in utility closet installations.

Here's a competitively priced, thrifty-to-run unit that more than meets today's demand for low-cost heating... without sacrificing quality.

Here's the new SU-P in its handsome jacket... made of sturdy steel, finished in light green Hammertone baked enamel. Note the heat exchanger... made of 12 gauge steel... welded for durability and efficiency. Use the handy coupon to get full information—fast. Remember—when quality and economy count, count on Richmond.



Oil Burner and Combustion Chamber Assembly—flange mounted with 4 nuts for easy installation or removal. Stainless steel combustion chamber. Approved by Underwriters' Laboratories, Inc.

Type SU-P
Steel Oil-Fired Winter Air Conditioner. Two sizes—85,000 BTU and 106,000 BTU output at Bonnet.



RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.



Porcelain China



Gas Boilers



Rectangular Cast Iron Water



Water Air Conditioners
Gas—Cast iron or steel

See your Richmond dealer for more information.

Richmond Radiator Company AA/3
19 East 47th Street, New York 17, N. Y.
Please send me information and literature
on Richmond heating equipment and plumbing
fixtures.

NAME
COMPANY
ADDRESS

RYEX EXPANDED METAL



Now Available from Ryerson Stock

You'll find Ryex Expanded Metal perfectly suited to many profitable jobs. And these strong, rigid sheets of steel mesh are in good supply right now at your nearby Ryerson plant.

Ryex is available in two types—standard or flattened mesh—and in a wide variety of sizes and gauges. Both types are safe to handle because all sharp or rough edges have been removed. Both can be readily fabricated, without special tools or equipment, into machine guards, enclosures, walkways, air conditioning grills, ventilator guards, and a wide variety of other items.

In addition to Ryex carbon steel expanded metal from stock, your nearby Ryerson plant can furnish expanded stainless steel to special order. Though

sheet metal and other kinds of steel are in short supply due to the great demand, you can be sure we shall always do our best to take care of your requirements. So, for expanded metal or other steel needs—call your nearby Ryerson plant.

PRINCIPAL PRODUCTS

BARS—and bar shapes, black or galvanized.

STRUCTURALS—Channels, angles, beams, etc.

TUBING—Seamless & welded mechanical & boiler tubes.

SHEETS—Hot & cold rolled, many types & coatings.

PLATES—Many types, including Inland Safety Plate.

STAINLESS—Allegheny sheets, plates, angles, tubing, welding rod, etc.

MACHINERY & TOOLS—For metal fabrication.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

AMERICAN ARTISAN

Subcontracting for National Defense

AS the nation's defense effort gains momentum, more and more sheet metal shops and small manufacturing plants will be called upon to produce parts and assemblies of needed defense items. If you operate a small plant, you should consider carefully the possibility of obtaining subcontracts from large companies which have prime contracts for defense equipment.

Subcontracting is not, of course, an arrangement that is used only during emergency periods. Even in normal times, it is a basic feature of many industries; for example, the automobile and aviation industries. During defense preparedness periods, however, when the greatest possible production is needed, subcontracting takes on added importance.

Advantages offered to the small plant. Subcontracting for defense work offers these important advantages to the small plant:

1. It may enable the plant to operate at full or near-full capacity in spite of a reduced supply of materials for its normal operations. Under Regulation 2 of the National Production Authority, a prime contractor for defense items receives a priority rating for needed materials and can pass the rating along to his subcontractors.
2. It may lead to deferment from military service of skilled workers who are essential to the plant — an important consideration if manpower shortages develop.
3. It gives the small plant an opportunity to contribute to the defense effort.
4. It may lead to improvements in the small plant's operations, since prime contractors often give their subcontractors valuable advice on production and management methods.
5. It provides the small plant with possible sources of continued work after the defense preparedness effort is ended.

Problems encountered by the small plant. Subcontracting also offers problems which should be considered and, if subcontracts are assumed, kept in mind. The first of these is the possibility that, once having started subcontracting work, it will

become the major operation of your plant, to the neglect or discontinuance of your normal work. This could result in your being without a market between subcontracts or after your last one is completed. Another danger is that any new equipment purchased in order to carry out subcontracts may not be needed later for normal operations.

Should you seek subcontracts? In deciding whether it would be practical for you to solicit subcontracts, some factors to consider are:

1. Your present and anticipated volume of business. How long will your non-defense work continue in light of approaching raw material scarcities? Do you now have or does it appear that you will have sufficient open capacity to enable you to fulfill subcontracts?
2. The item you now manufacture and the processes employed in manufacturing it. Could the item be used, in its present form, as a part of defense equipment? If not, would minor modifications make it usable for defense purposes? Using the same processes which you now employ, could you turn out a different kind of item, one which is needed for defense production?
3. Your equipment. Is it in good condition? Would it stand up, if necessary, under long hours of operating at peak capacity?
4. Tolerances. Are you and your workers accustomed to working to close tolerance? If not, do you believe that you could satisfactorily produce work of the close tolerances required for parts of defense equipment?
5. Working capital. Do you have an adequate reserve of working capital? If not, would your local bank or other source of capital be willing to advance the money needed to carry out subcontracts?

Learning of prime contractors. If, after studying the preceding questions carefully, you feel that you should look further into subcontracting, the next step is to learn the names of prime contractors for defense items and the items for which they have been awarded contracts. Once you have this information, you can select those manufacturers who

are most likely to need the type of services your plant can offer.

Your first efforts probably should be directed toward learning of prime contractors who are located in your own area. It would be easier to work with them than with companies located at some distance; there is more chance of their having some previous knowledge of your plant; and, if they become interested in farming out work to you, they can more conveniently send a representative to look over your facilities.

Perhaps you already know of large companies in your area which are producing defense items, or can learn of such companies through your customers, suppliers, or other business contacts, or through the local businessmen's association.

If you subscribe to a trade magazine, you may find that it is one of a number which report on bid awards of interest to their readers, giving the names of the successful bidders, and the items and quantities contracted for. If your trade magazine does not publish this information, a large public library may be able to tell you of magazines that do.

Information on Contracts

One of the most comprehensive sources of information on bid awards is the procurement assistance program of the Office of Small Business, Department of Commerce. Under this program, major procurement offices of the Army, Navy, and Air Force provide the Office of Small Business with weekly reports on all contracts which are of a non-secret nature and which are in excess of \$25,000. These reports are consolidated, published, and made available for reference at Department of Commerce Field Offices and 5,000 cooperating outlets. They give the names and locations of prime contractors, the items contracted for, and the number and dollar value of the units involved. By reading these weekly synopses regularly, you can locate possible subcontracting opportunities in your area and in your specialized field.

If you are located at a distance from the Department of Commerce Field Office which serves your area, you can write to it for the address of the nearest cooperating procurement information office, which may be a local chamber of commerce, bank, public utility, industrial development commission or other public interest group. (If there is neither a Department Field Office nor a cooperating information outlet in your city, you might urge the local business or industrial association to become a cooperating office. If it wishes to do so, it should apply to the nearest Department Field Office.)

Another source of information on contracts awarded by the Federal government is the weekly Public Contracts Bulletin of the Wage and Hour and Public Contracts Division, U. S. Department of

Labor, Washington 25, D. C. The bulletin lists reports from all government agencies on awarded contracts which are subject to the provisions of the Walsh-Healey Act. This act applies to all government contracts in excess of \$10,000, setting standards for minimum wages and working conditions of employees engaged in work under the contracts. Upon written request to the Department of Labor, your name will be placed on the mailing list for the bulletin.

What a prime contractor will want to know.

When you approach a prime contractor in regard to obtaining a subcontract, it is important to provide him with helpful, basic information about your plant. The information he will want probably will be of the following types:

1. A description of your plant, its facilities and location.
2. The products you now are making, products previously made, and the processes employed in making them.
3. Any previous experience as a subcontractor, names of companies for whom you subcontracted, and items so produced.
4. An estimate of your available machine capacity.
5. A listing, with brief descriptions, of the types, kinds, sizes, ages, and conditions of your machines.
6. The tolerances to which you usually work, and the closest tolerances to which you can work.
7. The materials you use, in order of greatest use.
8. The number and kinds of employees on your payroll, including qualifications of key personnel.
9. The current financial condition of your plant.
10. The nature of your cost records, including the length of time they have been in use.
11. Transportation and shipping facilities available to your plant.

You might prepare a brief presentation of this and other information that you believe would be helpful in obtaining subcontracts, and have copies duplicated. A copy then could be given or mailed, with a covering letter, to each prime contractor from whom you solicit work.

If, from the information presented to him, a prime contractor is satisfied that you and he might be able to work together, he may send a representative, probably a field engineer, to inspect your plant. The representative generally will check the condition of equipment, shop layout, production control and inspection methods, cost records and wage rates. A favorable report from the representative generally would lead to your being asked to bid on future subcontracts to be awarded by his company.

(Please turn to page 154)

Rely On The Older Workers Again

ERNEST W. FAIR

ONCE more young men are being called into the armed services from out of industry. Once more the future supply of young workers for our sheet metal shops has a cloud of uncertainty hanging over it.

Once again we must take a careful look at the abilities of the older workers and weigh all known factors in careful balance.

Analysis after analysis in studies of both the physiology and psychology of age have shown that the rapidity of the decline in quality and quantity of performance after 40 years is less than the average employer believes it to be. In most cases, the decline has been so small as to be unimportant.

Arguments Against

One of the arguments that has been placed against the older worker relates to higher costs for compensation insurance and pension plans. While age is not usually a factor in compensation rates, it can be if the staff is overly loaded with older workers.

Another popular argument against old timers is that the man nearing 40 slows down in muscular strength and endurance. His reflexes are slower, and his hearing and eyesight begin to fail. These changes do occur, but whenever we consider such changes we must constantly bear in mind that changes with age do not necessarily mean decline.

Compensations

Where certain capacities diminish others are often enhanced. For example, as the speed of reaction is lowered with age, there occurs a compensatory increase in endurance. In athletic performance there is a positive correlation between maturity and success in competition requiring endurance. Records for sprints are held by young men, but older men invariably hold those for marathon running.

Greater differences can be observed in an exercise endurance test in persons in the same age group, than are observed between younger and middle-aged groups. Tests have also demonstrated that loss of physical strength is normally compensated by increased skill and good judgment resulting from long training.

Age, as measured in years and months, is not the same as physiological age. No worker is any older than his vision, his motor skill, or his productivity. The important factors to consider in older men relate to their functional age or ability to perform efficiently the tasks involved in each job.

All of the senses show a decrease in acuteness with age. The change visually is in one's ability to focus on near objects. This can today be completely corrected by means of eyeglasses. There is a slight contraction of the visual field, or ability to see out of the corner of one's eye. Dark adaptation, or ability to see in the dark, also declines. Depth perception, or the ability to see and judge distances, shows an improvement up to the age of 30 to 35. Then there is a gradual decline which becomes fairly marked after 60. However, one test of 8,400 employees showed as many able to pass the test in the older age brackets as those in their 20's.

Body Structure

Motor activity, although controlled by nervous impulses, is to a great degree dependent on anatomical structures. It reflects the alterations which occur in the body. Stanford University studies of adult motor activity, however, did not reveal any sudden alterations in relation to any age group. On the contrary, numerous studies have shown that the older employees tend to have fewer accidents, so other factors appear to compensate for this change in age.

The decline in mental functions is less than is generally believed. In an extensive study at Columbia University it was shown that although the ability to learn showed a definite rise in the early years, the decline later was slight. Difficulty can be expected in unlearning previously learned and established patterns.

In general, meanings, and recognition of generalized truths, critical judgement, and standards of excellence tend to remain undiminished to the end of the life span.

In a report to the United States Secretary of Labor by the Committee on Employment Problems of Older Workers results showed no definite relation between

(Please turn to page 168)

McCLURE HEATING CO.



The converted auto showroom makes an ideal twin display area for this heating company. The center driveway enters the shop.

One Year's Free Service—Including Replacement Builds Volume For Heating Contractor

ROBERT LATIMER

OFFERING the homeowner one year's free service, without conditions of any sort, and including replacement or changes as the customer desires, has combined with a handsome dual showroom to sell more than 15,000 heating systems for McClure Heating Co., Colfax at Oneida, in Denver, Colorado.

Higher Prices

This company, founded a little more than 12 years ago, averages around 15 per cent higher in price on its heating and ventilating work than the usual competitor; yet continually turns down as many contracts as it accepts. At peak, the shop has operated with a crew of 50 men, and during one week following the war, no less than 57 separate heating plants were installed.

Reputation

There are a lot of reasons for such sales success, according to Harry McClure, son of the founder and currently head of the firm. Included are the long-established reputation of McClure engineers for solving the tough problems, the two automatic heating equipment showrooms at the front of the building, and a selling program which emphasizes taking the prospect

around to visit a previously-sold customer. Most productive, however, has been the free service policy indicated above, which the company has kept in force during its entire history.

Costly Service

"Free service means free service" Harry McClure stated. "By that I mean that if the owner needs a new duct added, a motor replaced, or any repairs or remodeling of any sort done, we do it without charge. Our theory is that every heating plant we install must keep selling our firm name, and to permit any sort of dissatisfaction to exist would be the most costly error we could make. Naturally, at times this becomes expensive, particularly where we must install a new motor or make changes which require two or three men several hours. However, the goodwill gained makes it more than worthwhile."

Usually, it is personal whims of the customer which are responsible for the need for free service. Every job when installed is individually engineered, work checked while in progress, and an engineer is on hand to survey its operation when the first heat is turned on. Despite this, there are always a few customers who find something which they wish changed. In every instance, the company cheerfully foots the bill.

"Here's the real payoff under such conditions" the Denver heating contractor indicated. "We use the user heavily in selling the type of work we want to do most. By that I mean that we keep close records on every job installed. When a prospect is dubious over an installation, we bundle him into a company car, and take him out to a home where the same type of heating plant is in use. We've followed the practice for years, asking each customer before the heating plant is completed if we may occasionally use it as a model to demonstrate to other customers. This we find generally flatters the homeowner, and most of them are quite willing to cooperate. Nothing is more helpful in selling the prospect who is on the fence as to whether to buy than to have an enthusiastic commendation from a similar homeowner. Thus, if we continuously give good-will-building service, irrespective of costs, we keep every customer a selling asset."

Advertising

Like most firms, there have been some experiments with direct mail, broadcasting of 10,000 pamphlets at a time on the advantages of automatic heating, newspaper promotions, etc. However, after years of study, Mr. McClure believes that a quarter page newspaper ad, at periodic intervals, which exactly duplicates a telephone directory ad of similar size, is most effective. "Ninety per cent of our business comes in over the telephone" he indicated. "Either from homeowners whose friends have recommended us, or those who have responded to telephone directory or newspaper advertising. We were disappointed in the use of some direct mail experiments, and have found it better to stick to plain, general-interest advertising."

Pre-War Expansion

The McClure concern moved to its third location, near popular and fast-building East Denver residential districts, three years before the war. The move was exceedingly timely and fortunate, inasmuch as following years brought a rush of sales and service which could not have been met in the former downtown Denver shop. The building taken over, incidentally, was an automobile garage, with a deeply recessed center entrance, and offices on either side. This resulted in an unusual showroom opportunity—which was to convert the two offices into "twin showrooms", with a roofed-in, weather-protected driveway in between. Both showrooms are modernistically arranged, with half a dozen automatic heating units on either side, all connected, and ready for demonstrations. "Two showrooms mean that we can show every type of heating plant, conversion unit, or sheet metal work we offer, without the need of taking the customer back into the shop area to look at them," Mr. McClure added. "Immaculate neatness and cleanliness in showroom presentation, we have found, carries a lot of weight with women who visit the showroom with their husbands. Where possible,

we maintain the shop in the same way, and encourage prospects whose minds are intent upon clean basement playrooms, dens, etc., to look over a shop which fits the same category."

Finishing Touches

The high percentage of work which the company regularly refuses is based primarily on the higher price which the firm has realized per job for many years. The 15 per cent higher rate which normally is the aver-



One of the McClure sport cars.
The body work on these cars is all done in the sheet metal shop.

age goes a long way toward paying for extra niceties in installation, complete finishing for eye-appeal on all metal work and heating plants, plus the free service program. "We could do a much larger volume if we would bring our rates down," Mr. McClure said. "But we prefer to do so good a job on every installation that the customer will boost us thereafter."

Unusual Hobby

Mr. McClure, himself, is an advertising asset for the firm due to a highly unusual and interest-absorbing hobby. This is the building of custom sport cars, which he constructs himself during spare hours in the capacious McClure shops. Around eight have been built to date, including torpedo speedsters mounted on Buick chassis, closely resembling expensive French and Italian models, streamlined sedans, racing cars, and other sport models. All are carried out to perfection, leather upholstered, given factory bake-on enamel finishes, and equipped with custom tops, instruments, foreign tires, etc. During the war, he was an Air Force pilot, ferrying every type of combat aircraft around the globe for the Air Transport Command.

Accounting Terms Defined

ARTHUR ROBERTS

Pompton Lakes, N. J.

Any heating and sheet metal contractor should have a basic knowledge of the language of accounting. It is difficult to understand any subject if the terms are not clear in meaning. Misunderstanding can be expensive.

TO read intelligently, one must understand the written word. From our field contacts with *Indoor Comfort* dealers, we find that many do not know what certain accounting terms mean. Either they do not know or confuse one term with another, and thus, cannot get maximum benefit from business counsel given them. Often a misconstrued word may distort understanding so that the reader takes erroneous action and does more harm than good to his business. Many times in the past, we have found dealers following practices detrimental to their interest. Inquiry revealed that this was a result of misinterpreting certain accounting terms used in connection with advice on better business management.

Terms Defined

Before one can comprehend a subject thoroughly, one must understand its terminology thoroughly. Hence, we offer a lexicon of accounting terms with their detailed definitions. The reader will then have clearly in mind what is meant by them and can make intelligent application of counsel given him in these troubled times when he needs all the managerial guidance he can get. The terms selected are those most frequently misunderstood and misapplied.

Reserves, sinking fund.

The former is only a book figure produced by charging current profits for depreciation and crediting a reserve. One can have \$25,000 in reserves on the books and not a nickel in the bank. The reserve accounts are just book figures to bring current profits and net worth into proper perspective and are of no financial help when new depreciable assets must be purchased. A sinking fund represents actual cash or securities laid aside to buy replacements. This account is an asset on the books, whereas, a reserve account is on the liability side.

Net worth, capital investment, invested capital.

They mean the same thing, the difference between assets and liabilities, but only when the business is owned by an individual or a partnership. Capital investment plus surplus is the net worth of a corporation.

Current assets, current ratio.

Many think that these terms mean the same thing. They are wrong. One dealer told us, "I have \$4,000 working capital so have nothing to worry about." We checked his books and found that he had a floating debt. He had plenty to worry about. He had \$4,000 in current assets all right, but he had \$4,200 in current liabilities, leaving a floating debt of \$200. The current ratio is the difference between current assets and current liabilities, which gives the working capital, also called net current assets and net working capital. To have \$4,000 working capital, the dealer would have had \$8,200 in current assets and \$4,200 in current liabilities.

Capital assets, fixed assets.

They mean the same thing, the working equipment needed to operate the business, such as showroom fixtures, shop equipment, trucks, business property, etc. The dealer should take depreciation on these assets each year. From a financial standpoint, they are not as desirable as current assets—cash, receivables, and inventory—because fixed assets cannot be liquidated quickly and may bring only 10 cents on the dollar in the event of a forced sale.

Spread, gross profit, margin.

Spread is the difference between the cost of re-sale material and the selling price. Gross profit and margin mean the same thing, but modern businessmen have discarded the former term because there is no profit until overhead expense is deducted.

Mark-up, margin.

These terms are often used synonymously, but they

are two different things and their application varies widely. Margin is the result of subtracting the cost of goods sold from the selling price, whereas, mark-up involves addition, not subtraction. It is the amount added to the cost of goods sold. Margin is always a percentage of sales, whereas, mark-up is a percentage of cost. "So what?", you may ask. "As long as the margin is ample to cover overhead and a satisfactory net profit, what difference does it make whether you call it mark-up or margin?" It doesn't make any difference if you appreciate the mathematical variance resulting from the application of mark-up and margin to operating figures. Profit and loss statements are prepared to show ratios to sales, which are considered 100 per cent. If overhead and net profit average 40 per cent of sales, a 40 per cent mark-up on the cost of material sold won't cover this spread. The mark-up percentage on cost must always be more than the margin percentage on sales. If a 40 per cent spread is required on sales the items must be marked up 66.7 per cent or loss will result.

Many dealers short-price their inventory or have a tendency to cut prices because they do not appreciate the mathematical variance between mark-up and margin when applied to pricing or profit and loss statement analysis.

Value of Stock

Book value.

Dealers doing business as a corporation have often asked us how to determine the book value of their stock. It is the total of the value of outstanding shares plus the surplus, divided by the number of shares outstanding. For example, if capital stock outstanding is \$50,000, surplus \$30,000, or \$80,000 total, and there are 500 shares outstanding, book value per share is \$160.

Corporation stock has three other values, making four in all. Par value is the price on the stock certificate; market value, the listing on the exchange; actual value is the price for which it is sold.

Goodwill.

An intangible asset reflecting the prestige of a business in terms of customer following. Advertising is a big factor in building goodwill. Actually, it is the price a buyer will pay for a business in excess of its net worth. Sometimes it is worth more than tangible assets. It should never be capitalized. It should be listed on the financial statement at \$1 if it is shown at all.

Capitalize.

An expenditure is capitalized when the amount expended for improvements or additions is added to the cost of fixed assets. Some dealers capitalize repairs as well as improvements. This is poor policy because they lose the income tax deductions for repairs; they inflate the value of their assets and also their profits. Classify all repairs as expenses. Do not capitalize them as assets.

Comparative analysis.

The comparison of current business figures with figures prepared in a similar manner covering a prior period or periods.

Fixed charges.

The overhead expenses that remain the same over a period of time, such as mortgage interest, property taxes, insurance, depreciation. If you are weighted down with high fixed charges, you are in a disadvantageous position if sales or profits decrease because you can't cut expenses.

Variable Charges

These expenses may differ from month to month, in fact, with the exception of salaries, they usually do. These expenses can be cut when sales or profits decline. Hence, the wise dealer tries to keep variable charges at a much higher ratio to total overhead than fixed charges.

Accrued expenses or liabilities.

These expenses are due to the date of the business statement, but not entered on the books, such as mortgage interest, property taxes, income taxes. If the dealer does not consider such expenses, the profit or net worth on the statement will be inflated.

Deferred charges or assets.

Charges already paid or incurred that cover a period subsequent to the date of the business statement, such as insurance prepaid for an entire year. If not shown on a business statement, profit or net worth will be deflated.

Classifying Sales

Departmentization.

Breaking down total sales to lines or departments and charging each classification with the outlay directly chargeable to it and a proportionate share of the indirect expense incurred in general business operation. The dealer should keep departmental records of installations and repairs, segregating its income and outgo apart from over-counter sales. He may also break down his sales to automatic heating jobs, air conditioning, including window cooling devices, sheet metal work, etc., depending upon his merchandising set-up.

Budget.

A planned estimate of what the business should do in a forthcoming period. This estimate is based upon a review of prior operating figures and a forecast of income, outgo and net profit for a forthcoming period.

Cost or market, whichever is lower.

A term denoting the value of the inventory priced at market or replacement price if that is less than the cost price of the material. The government permits this inventory valuation for income tax purposes. The profit shown on the books and the tax on that profit depend a great deal on how inventory is valued. The use of this formula is the best way, we think, to arrive at a correct valuation.

It's The Copy That Sells

DAVID MARKSTEIN

THE pen has long been alleged to be mightier than the sword. Advertising men know that it is also mightier than the artist's brush. It is not the pictures or pretty layouts which sell. It is the copy. Good illustrations and other attention getting devices are highly important. They lead the reader to the copy.

But the copy carries the heavy selling load. Alone, good selling copy would bring in sales. Without it, the best of illustrations can carry little selling conviction.

Does it take talent or special genius to write effective advertising copy for selling *Indoor Comfort*? Not at all. Any dealer can write strong selling copy if he follows certain rules which experience has proved to be sound. Fit selling words into the forms found effective for advertising copy and you can take out of those forms as sound a sales message as any professional could manufacture.

Visualize Prospect

As a first step in writing copy that sells, many pros use a trick of visualization. "I try to picture the prospect whom I want to reach, sitting on the other side of my desk," an ace copywriter recently told an advertising class of neophytes.

"To build up this picture of the man I want to talk to, I ask myself who is he? What is his income? What is his position in life? What are his worries? What are his political opinions? How does his mind work? What are the things which make him react? What does he want out of life that I can offer to him?"

"After I have put together an actual picture of this prospect, then, in imagination, I seat him in a chair on the other side of my desk. As I write the copy, I visualize how this prospect would react if I were talking those words to him in person.

"I try to listen for any unspoken objections he might raise to my sales talk. Then I answer them, right in the copy. It is vastly important to find the objections in advance of preparing the final copy draft. If he were real and I were a salesman, it would be simple to answer objections as they were spoken. But he is not really there in my office. He is somewhere else, and when he reads the copy he won't put the objections

into words because there will be nothing but a cold printed page to answer them. Yet, unless his objections are answered, the copy cannot sell him. An advertising writer has to ferret them out in advance, from the imagined prospect on the other side of his desk, and incorporate in his copy real selling answers that will turn the but points into buy-points."

That term, buy-points, is the key to composition of successful copy.

What you sell isn't important. What the prospect buys is important. Where is the difference between these two?

The contractor sells heating systems. The prospect buys something with which to keep his family warm and his fuel bills low.

The paper house sells cups. The prospect buys a drip-proof receptacle into which he can pour his soft drink.

When it comes to flooring, the tile company sells tiles, but the customer wants to buy beauty, economy, permanence. That is what the Kentile people sold in this bit of effective advertising copy that ran recently in the *Saturday Evening Post*:

"Laid tile by tile, Kentile enables you to choose any combination of colors. At low cost you'll have a floor that's impressive to visitors...pleasing to your office staff. And Kentile's glowing beauty won't be affected by the hardest use!

"Kentile colors can't wear off—they go right through each tile. The smooth, dirt-resisting surface makes cleaning an easy matter. Occasional no-rub waxings and Kentile gleams like new—so you save on upkeep expense, too."

Who wants to buy paint? The painting contractor does—but few consumers want paint. They want brightness, beauty, protection. Here is how the National Paint, Varnish and Lacquer Association sold these buy-points in the same issue of the *Post*:

"Here's your chance to take your dreams out of moth balls—and turn your living room into something that fairly sparkles with new beauty.

"Just about \$10 worth of paint, that's all you need, and your living room will belong to enchantment. A

few dollars more, and you can work the same miracle in your dining room and other rooms while you're at it.

"Then listen—hear all those compliments? It's wonderful to have the house that people envy. How smart you are to have remembered that it costs so little to paint with today's durable paint, and it always costs more not to paint."

In addition to selling beauty, the association sold another important thing that all people want—envy, in the form of the compliments that a paint-up campaign was sure to produce.

The problem approach can help to put these buy-points into copy form. This approach is based upon the fact that unless a prospect has a problem which you can solve for him, he is not very likely to buy. If he has a problem, and you can offer him a good solution to the problem, then you'll be on the inside track to a sale.

Posing A Problem

National advertisers are consistent users of the problem approach. Remington Rand asks in a magazine advertisement for its electric razor:

"Is your face tender—whiskers rough? Do you like close, smooth shaves? You do? Well then, consider this a personal challenge from Remington.

"Here's all you do—take your tough whiskers to any Remington dealer—or bring them to any one of our shaver headquarters and ask for a Remington contour shave! One shave will convince you, exactly as thousands of others have been convinced—there is no shave, nor shaving method to compare with a Remington contour shave.

"For a close, smooth, comfortable shave without fuss or bother—try the Remington contour DeLuxe."

Scottissue towels tells readers of a washroom problem: "You can tell a lot about a firm from the condition of its washrooms. Don't you feel annoyed, even insulted, when you enter a sloppy, ill-kept washroom? A clean, modern washroom with a constant supply of hot water, soap and Scottissue towels shows a high regard for employees... is proof indeed of good, sound management."

The first few words of the selling copy should rock the reader; set him back, figuratively, on his heels. They should make the benefit offered by the ad as specific and immediate as possible.

Mollé packed the maximum amount of selling punch into the first sentence of this national advertisement:

"Compare Mollé with your present cream, and if Mollé doesn't give you a quicker, cleaner, closer, cooler shave... we'll refund double your purchase price."

General Electric stepped right into the customer's want-area by offering a whopping competitive benefit in this opening sentence:

"You can store 389 pounds of frozen food in this handsome G. E. home freezer."

One of the nation's most successful advertising men recently offered sound—but often neglected—advice for writing sales copy. "So many ads start out indefinitely and wind up nowhere," he said, "because they do not have defined aims. Sure, the man who wrote the ad knew in a hazy sort of way that he wanted to sell something. But that isn't enough.

"It is necessary to decide exactly what the writer wants the reader to do. Should the reader stand on his head when he finishes the ad? Or should he put on his hat and rush out to watch the Philadelphia Eagles battle the Green Bay Packers on the gridiron? Does the writer want his reader to go lick a postage stamp, or cook up a mess of shrimp?

"Before I put the first word down on paper, I know exactly what I expect the advertisement to accomplish. After I have a picture of the specific action which I want the reader to take, I can tailor each sentence so that it takes him one step nearer to that action, concluding with a final fillip to move him into instant motion."

Over the years, advertising copywriters have worked out a definite format for selling copy. It is called AIDA—A for attention, I for interest, D for desire, and the final A for action.

The first thought should rock the reader into giving the ad his attention.

The thought immediately following this should hold his interest and keep him going through the rest of the copy.

Then you give him both barrels, reciting all of the buy-points, and the competitive advantages missed if he should not buy from you.

Finally, move him to taking some concrete first action without delay. Tomorrow won't do. He must take the action now, the minute he puts the ad down, while his desire is still strong.

Strong Urges

There are well-established human urges—the urge for life, the urge to reproduce life, the urge for financial means, the urge to enjoy the five senses, the urge for bodily comfort, and last (but close to the top in importance), the urge for greater personal importance. Advertising copy tied to these important urges gets the orders.

Here is an effective block of copy that incorporates two of these urges—the urge for personal importance (look better), and the urge for bodily comfort (feel better):

"Select any one of these smart Jarman models and you have authentic styling at its best—plus the superb walking comfort you always desire and need. In short, you look smarter and feel better. That's what millions of American men have discovered about Jarman shoes; and with one telling another, it's no wonder more and more men chose Jarman's every season. For spring, there's a wide assortment of handsome Jarman patterns

(Please turn to page 172)

News Round-Up

(From page 54)

New Solders Developed

THE DEVELOPMENT of a group of solders which permits savings of 50 per cent or more in the tin normally used for solders has been announced by the newly formed Metals Conservation Committee of Federated Metals Division, American Smelting and Refining Co. Extensive research has been devoted to this project and results indicate that silver is the only metal readily available in volume that can be satisfactorily substituted for part of the tin in solder. There is virtually no loss in working efficiency and cost is less than that of the alloys they are designed to replace.

The new tin-conserving solders are basically silver-tin-lead alloys as compared with the usual tin-lead variety. The addition of a small percentage of silver permits a marked reduction in the tin content, at the same time giving a joint at least as good as that given by the original alloy. This solder group is an outgrowth of a similar series of solders developed and produced during World War II. It was proved in that crisis that industrial soldering operations could be continued without fear of failure through use of these ST (save tin) solders.

It was pointed out by Dr. Phillips, director of research, that for such a typical application as the joining of sheet metal—in heating or air conditioning work for example—the new ST-30 (30 per cent tin) solder would perform as well as the commonly used 50 per cent tin 50 per cent lead or 40 per cent tin-60 per cent lead solders.

The same fluxes can be used as heretofore, and the identical means of application are completely satisfactory. ST solders do require slightly more heat to melt, but this is compensated for by the fact that too much heat is not as harmful as it is to the usual tin-lead solders. Generally speaking, ST solders can be used for every purpose where tin-lead solders have been used.

SMCNA Convention

PLANS ARE BEING COMPLETED for the convention of the Sheet Metal Contractors' National Association, Inc. The event will be held at the Broadmoor Hotel, Colorado Springs, Colo., on April 30, May 1 and 2.

J. D. Wilder, executive secretary of the association, announced that plans for running a special train from Chicago to Colorado Springs had been abandoned. With the rapidly developing mobilization situation, fears were expressed that by the time of the convention special trains might be prohibited. As a result, all those wishing to go must handle their own transportation.

Arrangements have been made with the hotel to accept association members if they arrive on Sunday, April 29. Denver members of the association are urging all contractors who come to the meeting to spend some time sightseeing in Denver.

National Heating Wholesalers

PRESIDENT ARTHUR VORYS, of the National Heating Wholesalers Association, Inc., has appointed the following War Emergency Liaison Committee:

Charles Bird, Cincinnati Supply Co., Cincinnati, Ohio, Chairman

Harrison Somerville, Thos. Somerville Co., Washington, D.C.

John Phillips, Stelwagon Mfg. Co., Philadelphia, Pa.

Arthur Vorys, Vorys Bros., Inc., Columbus, Ohio, member, ex-officio

This committee will keep abreast of developments at Washington, and has already put the association on record as ready to cooperate with and aid the mobilization program to the fullest extent possible.



Charles Bird

A meeting of the Board of Trustees of the association, was held Tuesday, January 23rd, at 10:30 a.m. at the Benjamin Franklin Hotel, Philadelphia.

Thirty members of the association from all over the United States attended the luncheon that was held at noon. President Vorys presided at the meeting and informed those present of the effort the association is making to publicize the heating wholesaling industry, and to describe its functions, in reality those of pure wholesaling, — also of the work that is being done to provide Industry Claimant Agencies at Washington with substantial figures to back up essential heating wholesaling industry requirements.

Steel Supply

The critical supply situation in steel and other metals was the subject of a recent meeting in Washington between the Warm Air Heating Industry Advisory Committee and representatives of the National Production Authority.

The industry representatives pointed out the serious dislocations which are likely to arise from shortages of steel, aluminum, copper, and zinc. Discussions turned to the possibility of a controlled materials plan such as the one which operated during World War II.

NPA Regulations

Reg. 1—Inventory control.

Reg. 2, Amended—contains basic rules of the Priority System.

Del. 1—authorizes the Department of Defense to issue ratings as outlined in Reg. 2.

Del. 2—authorizes the Atomic Energy Commission to issue ratings as outlined in Reg. 2.

M-1, Amended—outlines rules for placing and scheduling orders for steel.

(Please turn to page 176)



Arnold Kruckman's Washington Letter

Defense Housing Plans

THE expensive public relations organization of the Federal government frequently coins new phrases and words. One of the latest expert productions is the word "reactivate". They love it, especially over in the Pentagon. They use it at the drop of a hat. It means to bring back to life plants, depots, air fields, and many other facilities which have been dormant since the last world war. This reactivation has an important bearing on the current quarrel over defense housing. An outline of what some of the impending reactivation means may help better to understand defense housing needs.

For instance, the Army is bringing back to life the arsenal at Ravenna, Ohio, one of the largest shell and bomb loading plants in operation during World War II. It is to be operated by the Firestone Tire and Rubber Co. with more than 4,000 employees. At Tobyhanna, Pennsylvania, near Scranton and Wilkes Barre, work has begun on a new Army Signal Corp depot to occupy a 1,400 acre tract. The installation will be permanent, with 2 million sq ft of storage space. It will provide employment for 5,000 persons.

The other day the Pentagon announced reactivation of five ordnance and chemical plants, four of them to be rehabilitated at a cost of more than \$24 million. The Hoosier plant, Charlestown, Indiana, will cost \$3,588,000. The Indiana Ordnance Works, also at Charlestown, is under rehabilitation at a cost of \$9 million.

The Rockford Ordnance Plant, Rockford, Illinois, to be reactivated immediately, will cost \$3 million. The Niagara Falls Chemical Plant, Niagara Falls, New York, is in process of rehabilitation at a cost of \$1,500,000. The Badger Ordnance Works, Baraboo, Wisconsin, will be rehabilitated at a cost of \$10 million. It is safe to say, collectively, these plants will employ between 6 and 10 thousand persons. At Morgantown, West Virginia, another ordnance operation has been initiated at a cost of \$9 million. It is known as the Morgantown Ordnance Works. It is the second largest producer of ammonia in the United States, when in operation. It is not known how many persons it will employ, but unquestionably the number will run into the thousands.

The Army has been using famous old Fort Dix, New Jersey, as a reception center for recruits. It has just been announced that the facilities at Fort Dix are needed so urgently that Camp Kilmer, New Jersey, will be opened as the reception center as soon as it has been rehabilitated, at a cost of \$3 million. Camp Kilmer is to accommodate 18,500 troops when it is in full operation. The U. S. Air Force has taken over a number of warehouse buildings, and other properties of the Tidewater Terminal areas of Port Newark, and some acres of the Newark airport. The Air Force will use the facilities for processing and shipping vehicles, aircraft, and general cargo in con-

nection with the defense program at home and abroad. Thousands of civilians as well as military personnel will be employed.

At Bainbridge, Maryland, the Navy Department recently reactivated the Naval Training Center which takes care of 20,000 recruits. At Trenton, New Jersey, the Navy is rapidly completing the Naval Aeronautical Turbine Laboratory, at a cost of \$1,200,000. It will be the center for the employment of a considerable number of civilians as well as Navy personnel. The Air Force, since the first of the year, has reactivated at least 18 to 20 air fields and air bases in various parts of the country. The tendency naturally is to put into operation those located in the areas with mild climate so they may be used the year round.

Recently the Pentagon announced that the San Marcos base, San Marcos, Texas, would resume operations as a training school. Just before that it was announced that Forbes air base, near Topeka, Kansas, would be reactivated as quickly as possible. There will be 8,500 military and civilian personnel at the Forbes air base. The Air Force plans to build a new air base near Wichita, Kansas, at a cost of \$37 million.

It is estimated that housing must be provided for six times as many persons as are scheduled for the service of each specific defense installation. For instance, at Forbes air base there will be 8,500 persons.



Washington Letter

This means that housing must be available for at least 45,000 people. This indicates roughly 10,000 housing units. The housing people of the Federal government say that wherever housing is needed it is necessary, not only to provide facilities for the actual active personnel, but also for their families, and for those who provide essential services for such communities. Obviously, there will be new shops, new laundries, new banks, schools, and all the other necessary aids to the comfort of a community. When you look back at the casual examples enumerated earlier in this letter you may begin to get a glimmering of the very extraordinary defense housing problem ahead. Bear in mind that this discussion thus far has not taken into consideration the housing needs that will arise with the expansion of defense plants, both new and old.

Rental Housing

Under the Wherry Act the Army has the power to negotiate for the construction of housing units at Army installations. Housing units must be built for rental. Private contractors are expected to take the risk and to supply the rental machinery. It is not a very popular enterprise. However, the law contains an escape clause whereby the operators can be bailed out by the Housing and Home Finance Agency. There are now 15,685 rental units of this type approved for Army installations. The latest are 100 units at Carlisle barracks, Pennsylvania, and 100 units at Milan arsenal, Milan,

Tennessee. These, as well as others, come under the umbrella of Title VIII of the National Housing Act.

Defense housing to be rented must not cost a government employee, or a person engaged in defense work, more than \$77 a month. In any discussion about defense housing, the Housing and Home Finance people always bear down heavily on the fact that the facilities required are not to be sold, but must be available for rental. For instance, during the next few months, it is anticipated that government personnel in Washington, D. C., will be increased not less than 300,000, and possibly as much as 500,000. In theory at least, these new employees are temporary additions. Rental housing will be required for them. The provision of this housing comes very definitely within the defense housing category. The significance of the problem comes home to you with emphasis when you realize that it is intended to disperse a large number of the agencies in Washington. There is a bill in Congress which authorizes construction of Federal buildings 20 to 30 miles from Washington. For this purpose the government will appropriate \$190 million. Obviously, this program does not include housing. Defense housing is a separate enterprise.

New Legislation

That brings us to the proposed Defense Housing Act itself. In the House the bill is known as HR-1272, and in the Senate it is known as S-349. In general, the bill provides

special FHA insurance on housing built for defense workers, with Federal financing of construction where needs for defense housing cannot be met through private enterprise. There is a provision for Federal aid in supplying community facilities and services for defense installations and workers. In isolated defense areas the law would empower the Federal government to buy the land upon which housing and other facilities are built. This is proposed in order to prevent land speculation.

The properties and facilities acquired by the government could be sold to private and public interests for actual construction or after the project has been brought into existence. A revolving fund of \$10 million would be supplied to buy and develop the land for defense housing purposes in isolated areas where war plants are to be built or expanded.

Insurance Program

The FHA mortgage-insurance program would be expanded by \$3 billion. This fund would be used on defense and regular housing, including any additional authorization required for small homes, rental and cooperative housing, military and atomic energy housing, and defense housing. It would be the responsibility of the President to allocate the \$3 billion among the various housing programs. There is also provided the sum of \$15 million for production of prefabricated housing which may be applied as loans and similar commitments. FHA mortgage-insur-

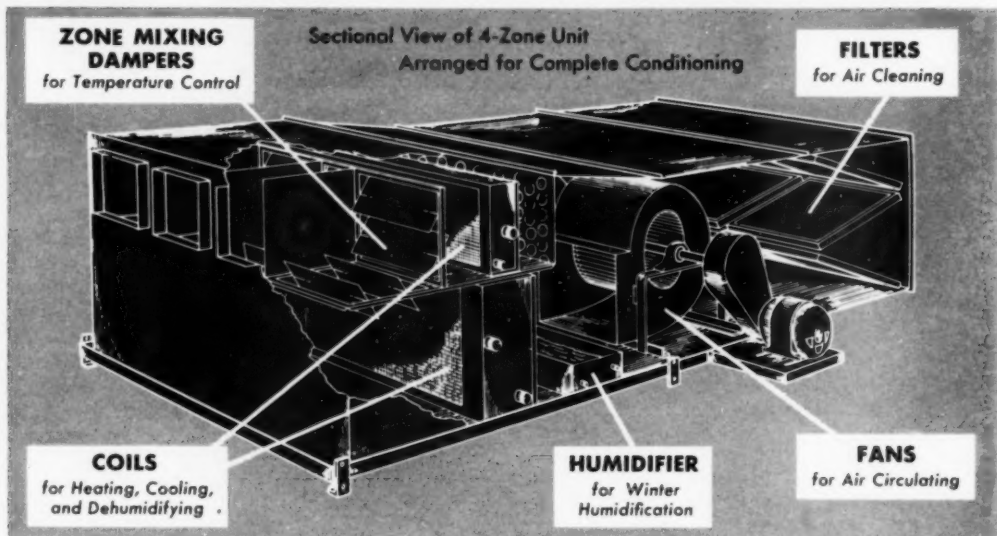
(Continued on page 156)



RESIDENTIAL AIR CONDITIONING *Section*

*Indoor comfort—in all seasons
for homes and small business*

Blow-Thru MULTITHERMS



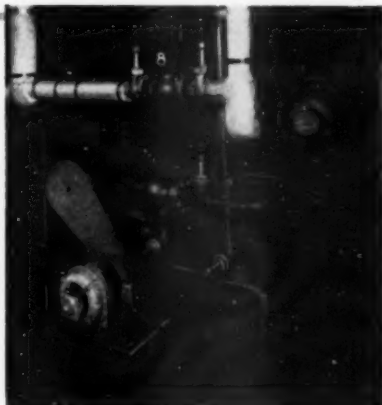
for ZONE CONTROL Air Conditioning

Different Temperatures and Humidities at the SAME Time with ONE Unit

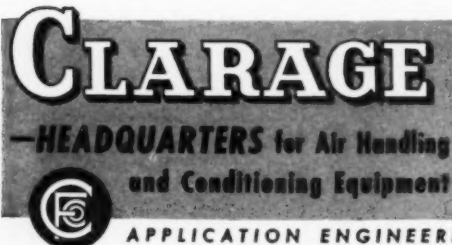
One Clarage Blow-Thru Multitherm can be used to air condition various parts of your building exactly as your requirements warrant.

ZONE CONTROL compensates for the difference in solar radiation on different parts of a building during different times of the day. It also takes into account variations of exposure, wind velocity, construction, and different internal heat loads.

Thus winter and summer, if desired, you can maintain different temperatures and different humidities in various parts of your building. Each zone is automatically and independently controlled — yet only ONE Clarage Blow-Thru Multitherm required.



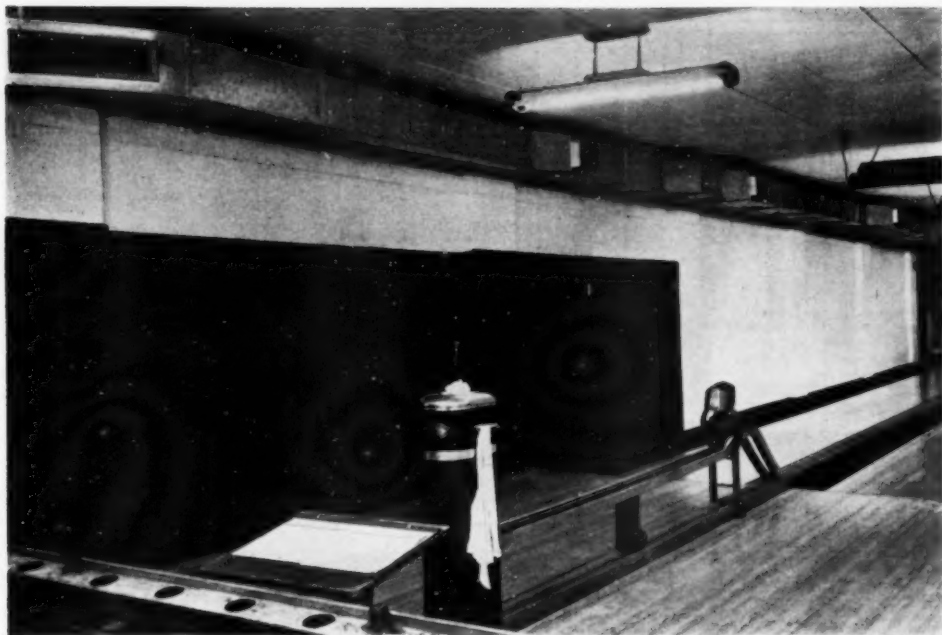
This 3-zone Blow-Thru Multitherm unit air conditions the 2-story office building of the Northern Indiana Brass Co., Elkhart, Indiana. Installation made in December, 1940.



NEW BULLETIN 1310 gives descriptive details, specifications, capacities, and dimensions. Send for your free copy today.

CLARAGE FAN COMPANY
KALAMAZOO, MICHIGAN

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



Supply duct in one of the bowling alley areas.

Oil Fired Heating-Ventilating System Provides for Future Cooling

Dissatisfaction with an inadequate warm air heating system was overcome with the installation of a zoned winter air conditioning plant which provides for the addition of summer cooling.

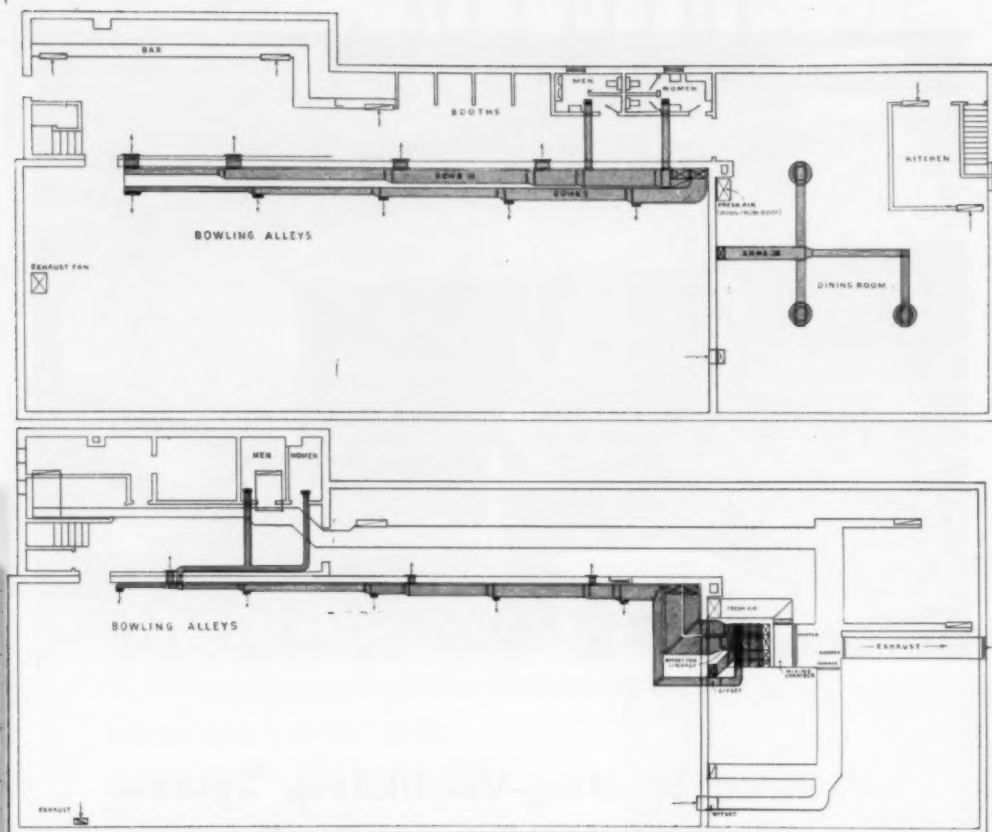
GEORGE T. COSTELLO*
THOMAS F. BURNIECE, JR.**

REMODELING jobs frequently bring about interesting problems. One unique job we encountered was in the modernization of an old bowling alley in northeast Minneapolis. The old building contained a bowling alley in the basement and another on the first floor with a narrow bar along one side. It was heated

by a stoker fired forced air furnace located under the barroom, with ducts running across the alleys about one third of the distance from the front. The job had never been satisfactory and the owners were skeptical of trying another warm air system. Their plans called for enlarging the barroom and the addition of a large dining room and kitchen at the rear of the building.

The old furnace was too small to handle the additional load and was located where they desired to build a locker room for the bowling alleys. It was the type of job frequently encountered where the architect who designed the additions specified everything but the heating. This

*National Heater Co., St. Paul
**Economy Sheet Metal, Minneapolis



Heating layout of the bar and bowling alleys.

was taken care of by a simple notation marking furnace area on the basement plan at the rear of the existing bowling alley. The owners themselves were not very sure of what they wanted and the contractor who had engaged our firm to remove the old equipment asked us to submit a proposal to do the job as we felt it should be done. In talking to the owners, we discovered that they did not use the bowling alleys in the summertime and therefore were not interesting in cooling that area. With this thought in mind, we drew up a plan for year round air conditioning of the bar and dining room and winter air conditioning of the two bowling alleys.

A Better Job

With the complete plans in hand our salesman sold the job to the owners. The installation ran over twice as much money as several bids from other firms. Since none of them made any attempt to do more than install a warm air furnace as had previously been used, it was possible for us to convince the owners that if they

wanted complete satisfaction they must plan for it from the beginning.

The essence of our system was continuous air circulation with individual temperature control in four zones and ventilation sufficient to provide for 100 per cent fresh air when desired.

Heat Loss

The calculated heat loss of the entire building, exclusive of ventilation requirements, though a heavy infiltration factor was considered, is approximately 410,000 Btu. The design of the heating system, based on the requirements of the Minneapolis heating code and the desired air changes, required blower capacity in the amount of 7,200 cfm against a total of 1 in. static resistance.

The automatic temperature control system is of the face and by-pass damper type with a full 100 per cent modulation. The automatic control on the fresh air provides for a low temperature of 55 F in the return



Dining room is supplied by ceiling air diffusers as shown at left.

Overized blower is housed in cabinet at right. Bypass ducts are taken off section connecting blower and heat exchanger.

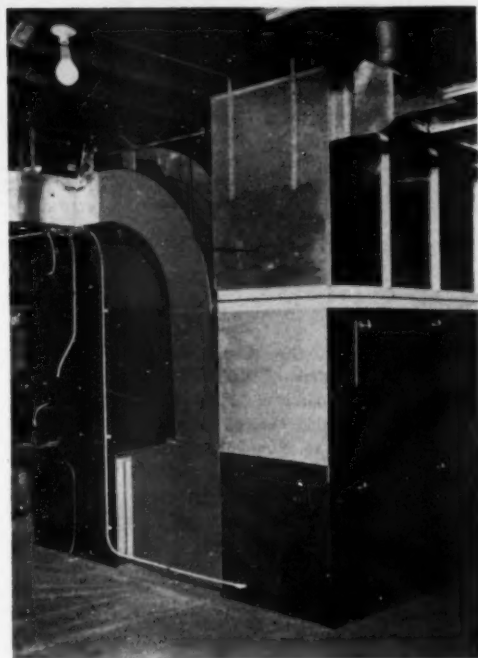
air mixing chamber. In other words, in the event that the return air temperature is in excess of 55 F the fresh air damper opens to admit a sufficient volume of outside air to reduce the return air and fresh air in circulation to a temperature of 55 F.

To meet these requirements, the plans specified installation of an oil fired heater-burner unit and a separate side mounted triple blower-filter-cabinet section usually furnished with a heater of larger capacity. This was done to obtain sufficient air volume at the design static pressure and required a triple 14 inch blower assembly driven by a 2 hp motor. As the illustration shows, the blower section sets on the side and to the right of the heat exchanger. The bypass duct connections are taken off the connecting ductwork between the two units. This bypass arrangement has proved very successful and we have standardized on this method on all installations requiring a complete modulating type system of variable air temperature control.

Zone Control

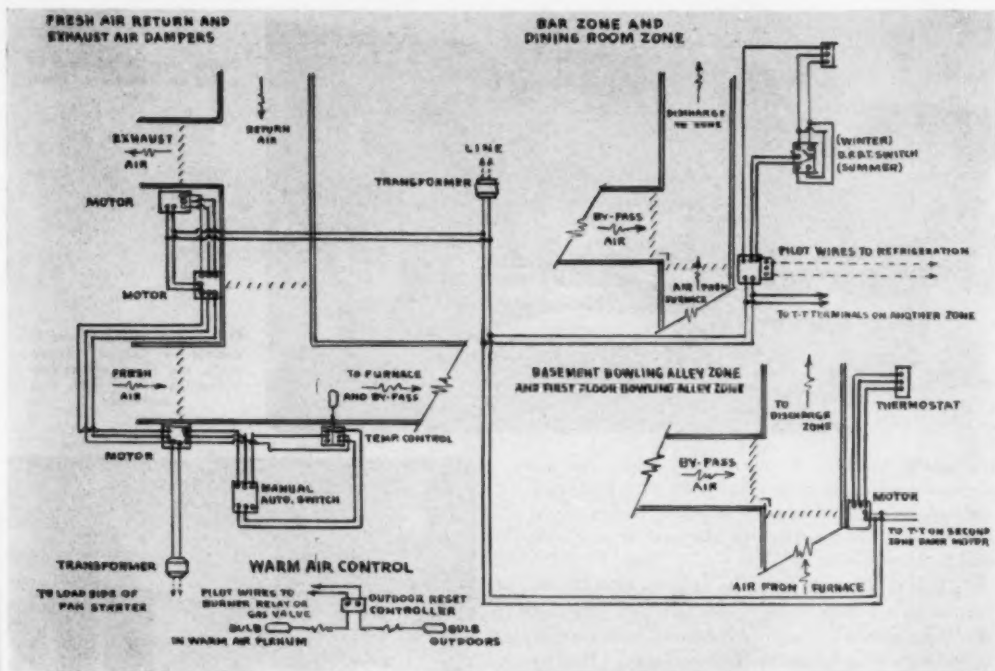
Each of the four control zones were provided with a separate bypass. The control of these zones was by means of a modulating type damper motor. Two multi-louvered dampers were placed at a 90 deg angle to each other, one above each discharge from the unit and one in each bypass, linked together mechanically so that the damper motors could provide any degree of conditioned air each zone required. The barroom and dining room thermostats were provided with a reverse polarity switch to provide year round temperature control.

Above the blower unit a bank of filters was installed in the mixing chamber. The return system and the fresh air duct were connected to this chamber and each provided with a multi-louvered damper controlled by modulating type motors. These motors were connected electrically so that any mixture of return and fresh air could be provided by setting the manual position switch or,



during the heating cycle, by setting the temperature control installed in the mixing chamber. In conjunction with this control system, an exhaust air duct was installed with another damper and motor connected electrically to these motors so that the exhaust damper would be opened whenever the fresh air damper was opened. The oil burner was fired by an outdoor reset control which automatically raised the bonnet temperature whenever the outdoor temperature falls.

The heating plant was isolated from the duct system by flexible connections using duct tape. With the exception of the dining room which was supplied by diffusers



Wiring diagram of the overall system.

in the ceiling, the other three zones were supplied by key operated registers. These registers are designed so that the louvered dampers behind the register face provide positive volume control. Use of these registers made it possible to eliminate the use of other type dampers in the supply ducts.

The dining room and barroom ducts were covered with fibre glass insulation to prepare for the installation of the summer cooling equipment, which, due to financial conditions, was postponed till a later date.

Satisfactory Operation

This plant has been in operation for one heating season and the owners are well satisfied that they made a wise choice in installing warm air. Their fuel bill for the entire season was less than \$700.00 and they stated that the ventilation of the building was so satisfactory that they have never been bothered by smoke or odors even when heavily occupied in both bowling alleys and the barroom.

One particular item which we would like to point out is that the city of Minneapolis has some of the most stringent rules in the nation with respect to the design of heating and ventilating systems and rating of equipment. Their inspection department was quite favorably impressed with the appearance and operation of the



Air is supplied to the bar by key operated registers in the wall at the right.

heating system. To obtain anywhere near the listed rating of oil designed heating equipment, it must be submitted to some bonafide testing laboratory for an impartial rating at capacities claimed and this data submitted to their heating department. Otherwise the unit will be rated using an unusually conservative efficiency and heat emission rate.

We are satisfied that it pays to go all out in your efforts to provide the best your ability can devise, rather than cut every corner in order to be able to submit an attractive price. It is just such tactics that have hurt the warm air industry and made it impossible for us to obtain many jobs that were rightfully the property of this industry.

Year Round Air Conditioning In Minnesota Home



Exterior view of the air conditioned residence

WALTER A. SWENBERG*
CLINTON HEDSTEN*

A well-designed complete air conditioning system is a feature of this Rochester home. Outdoor temperature control and a bypass arrangement were specified to give flexible operation during any kind of weather.

THE following data and procedures were used in the design of a combination heating and cooling unit for a residence in Rochester, Minnesota. Design procedures used are principally those recommended by the American Society of Heating and Ventilating Engineers. They may deviate in some instances because of unusual situations which call for sound judgment other than standard procedures, but still employ basic engineering principles as well as practical experience.

Heat Loss

Heat loss was determined for each individual room according to the National Warm Air Heating and Air Conditioning Association manual No. 3. Approximately 20 per cent was added to the heat loss for each bathroom and 2,500 Btu added for each room with a fireplace. The number of lineal feet of crack used in calculating infiltration losses was determined as follows: one or two sides of the room exposed to the outside, use the total crack; three sides exposed, use the two adjacent sides with the greatest crack. The crawl spaces under the house should all be heated to prevent cold floors, if the crawl space is exposed to the outside and has a heat loss.

Following is the heat loss calculated for each individual room:

*Utility Sales and Engineering, Rochester, Minn.

Room	Btu Loss
Living Room	16,900
Dining Room	11,800
Master Bedroom	9,000
First Floor Bath	1,750
Entry	6,980
Dinette	4,700
Kitchen	4,460
Utility Room & Hall	7,840
North Bedroom, 2nd Floor	16,100
South Bedroom, 2nd Floor	16,380



Workmen apply the finishing touches to the ductwork of the air conditioning system.

Hall	6,410
Bath	3,320
Future Bedroom	9,900
Recreation Room	18,400
Shower & Hall	2,063
Crawl Space	3,250
Total	142,213

Air Volume

The cubic feet of air required per minute for each room was determined by use of the following formula:

$$Q = HL/60 \times .24 d (t_s - 65) = HL \times \text{Factor} (1)$$

where:

Q = required air volume, cfm

HL = heat loss of room, Btuh

d = density of supply air

t_s = supply air temperature, F

0.24 = specific heat of air

65 = assumed return air temperature, F

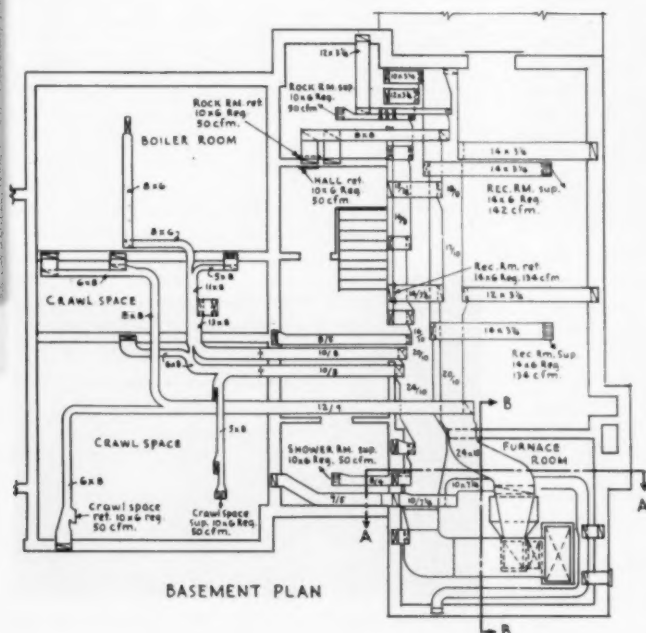
Factor = the reciprocal of the denominator and equal to a fixed value for any given register or supply air temperature. Values tabulated below:

t_s	Factor	t_s	Factor
110	0.0221	150	0.0125
120	0.0184	160	0.0114
130	0.0158	170	0.0105
140	0.0140		

In determining register air temperature t_s , a bonnet temperature, generally between 140 and 170 F, and a

temperature drop per lineal foot of duct are assumed. Tests have shown that this value varies between 0.3 and 0.6 F per lineal foot of uninsulated duct. For this residence, the bonnet temperature was assumed to be 150 F, and the duct loss to be 0.4 F per foot. The temperature reduction was subtracted from the assumed bonnet temperature for each register and the correct factor obtained. The factor multiplied by the heat loss gave the required air volume for each register.

Room	Cfm
Living Room, South Register	111
Living Room, North Register	114
Dining Room	176
Master Bedroom	137
Bath	27
Entry	102
Dinette	73
Kitchen	69
Utility Room	132
North Bedroom, North Register	123
North Bedroom, South Register	116
South Bedroom, South Register	107
South Bedroom, North Register	110
Bath & Hall	133
Future Bedroom	151
Recreation Room, 1	142
Recreation Room, 2	134
Shower & Hall	16
Rock Room	46
Crawl Space	51



BASEMENT PLAN

For rooms with required air quantities less than 50 cfm, 50 cfm is used.

As a general rule, rooms with required air quantities in excess of 150 cfm should have two supply registers. We have found that using high side-wall air conditioning registers, air quantities up to 200 cfm can be discharged through one register without causing any noticeable drafts.

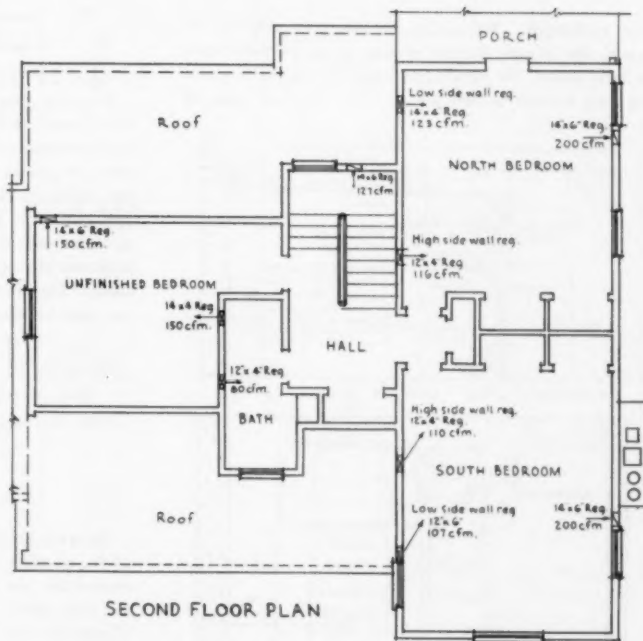
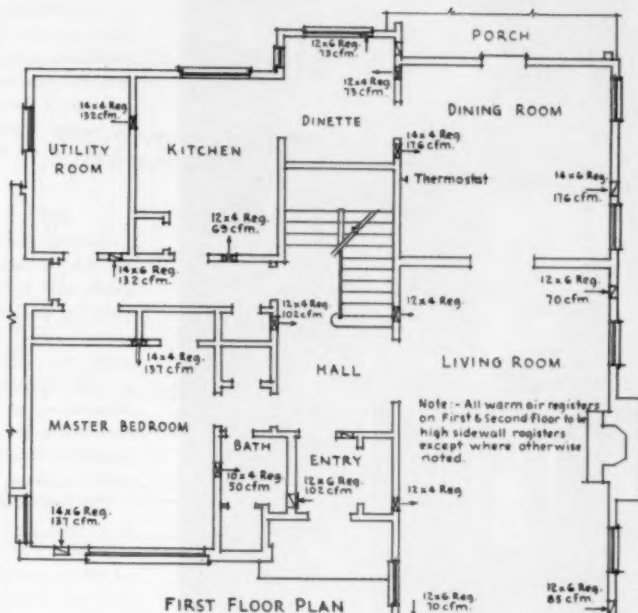
It should be noted here that although the cfm listed for each return on the plan is the same as the supply, it is realized that it is impossible to return more than 70 per cent of supply air quantity due to varying densities of supply and return air, air leakage losses, and air brought in through the fresh air intake. These values are cited for comparison purposes when balancing the system.

Ducts were sized by using a friction drop of 0.0006 in. w.g. per equivalent foot of duct for the long-

est equivalent run. The elbow equivalents used were those published in the American Society of Heating and Ventilating Engineers guide. The friction available at each branch takeoff was determined by the same method. A friction drop per foot of duct for each branch was determined by dividing the available friction in in. w.g. at the branch takeoff by the equivalent feet of duct in that branch. If there are any additional takeoffs from the branch, the main branch is considered in the same manner as the main trunk, determining the friction available at the secondary branch takeoff and a friction drop per equivalent foot of secondary duct determined. Ducts are then sized according to friction loss chart in the ASHVE guide using the cfm of air in each section of duct and the friction drop per foot of duct in that section.

Controls

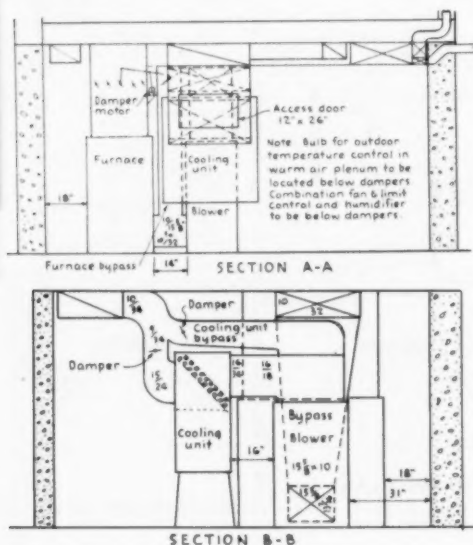
A bypass arrangement was used in this system to secure continuous operation of the blower. The bypass arrangement allows air to bypass the furnace and go directly from blower to plenum chamber and be mixed with heated air in accordance with the demands of the thermostat. A set of dampers are located in the bypass and warm air plenum and actuated by a modulating damper motor. A modulating thermostat controls the damper motor which opens and closes the dampers to mix bypassed air and heated air to the proper temperature to maintain desired house temperature. The temperature of the heated air before mixing with the bypassed air is controlled by means of an outside temperature control with a 1:1 ratio. That is, the air temperature is increased with a 1 F drop in temperature outside. When the thermostat is satisfied, all air passes through the bypass. An end switch mounted on the damper motor shuts off the burner whether the plenum is up to temperature or not, as determined by the outside temperature control. As the thermostat calls for heat, less air is bypassed, and more air passes over





Cooling unit is on the left, furnace on the right with the bypass ducts above. Dampers can be seen in the bypass duct.

heat exchanger. When the controls are properly adjusted, the bypass damper should never be fully open or fully closed, but should modulate continually, supplying just enough heated air to offset the heat loss of



the structure. All warm air registers are high sidewall air conditioning registers. In residences where more than one zone is necessary to obtain maximum comfort conditions, a separate thermostat, damper motor, bypass, and dampers are used for each zone. The system also contains a fresh air inlet which is manually adjusted to supply approximately 25 per cent fresh air to the system at all times.

Cooling Load

In determining the sensible and latent cooling load for this residence, the procedures given in the ASHVE guide were followed. The equipment was sized principally on the sensible load. In residential applications under normal conditions, the latent load is not too great and, with the exception of extreme conditions of outside humidity, not too undesirable. However, in determining air quantities necessary for proper comfort conditions, the latent load is quite important. Air quantities must be determined in order to assure that sufficient air is available to properly cool the residence.

The determination of air quantities for cooling load is a long and involved process but has been greatly simplified by use of the sensible heat factor and a set of tables published in *Modern Air Conditioning, Heating and Ventilating*, by Carrier, Cherne, and Grant. Sensible heat factor is a ratio of room sensible heat gain to total sensible and latent heat gain as follows:

$$F = Q_s / (Q_s + Q_l) \quad (2)$$

where:

F = Sensible heat factor

Q_l = Total latent heat load, Btuh

Q_s = Total sensible heat load, Btuh

Knowing this factor and any two of the following four desired room conditions; dry bulb temperature, wet bulb temperature, relative humidity, or grains of moisture per pound of dry air, it is possible by means of the tables in the volume mentioned to determine the apparatus dew point. The apparatus dew point is the saturated air temperature of supply air necessary to maintain the desired comfort conditions in the residence. The correct air quantity in cubic feet per minute can then be determined by the following formula:

$$Q_{cfm} = Q_s / 1.08(t_i - t_{as}) \quad (3)$$

where:

Q_{cfm} = required air volume, cfm

t_{as} = apparatus dewpoint, F

t_i = Inside air temperature, F

Balancing

Dampers are placed in each branch takeoff, preferably 24 in. or more from the takeoff to prevent turbulences created by the damper from affecting air stream in the main trunk. Where this is not possible, the damper is placed either at the takeoff or, when duct is furred in ceiling, in the riser and is accessible by removing

Proper Adjustment Of Gas Conversion Burners

Part II

P. K. WADSWORTH

Cleveland, Ohio

THE first thing to do in adjusting a conversion burner is to set the proper fuel input. Any changes in the firing rate will affect the CO₂ rate of the furnace, which means that the secondary air door will have to be changed and another orsat run. The best method is to figure the heat loss of the home accurately. Most servicemen are in a hurry to get to the next job, so a short cut can be used. Here is a speedy method that can be used for a design temperature of 0 F.

Cu ft of house x 300/60 = Btu input required

With this method the basement length and width are used as a basis for calculations and each floor is assumed to be 8 ft high.

Example: a one story home with a basement measuring 32 by 23 ft.

Multiplying 32 by 23 by 16 (8 ft for basement and first floor) gives the volume of the house as 11,776 cu ft. Multiply this figure by 300 and divide by 60. The result is the Btu input required; in this case, 58,800.

Always remember that this is just a quick method and is not completely accurate. It frequently serves the purpose, however.

After finding the Btu requirement, the following chart will give the elapsed time for one complete revolution of the gas meter for the necessary input. The pressure regulator can then be adjusted to the correct rate.

Before timing the gas meter for the furnace input, it is best to determine that no other gas appliances are in operation, since the meter reading would be misleading. The pilot on a range or water heater would not materially affect this reading.

Seconds for One Revolution	Size of Test Meter Dial			
	One Cu Ft	Two Cu Ft	Five Cu Ft	Ten Cu Ft
10	360	720	1800	3600
12	300	600	1500	3000
14	257	514	1286	2570
16	225	450	1125	2250
28	200	400	1000	2000
20	180	360	900	1800
22	164	327	818	1640
24	150	300	750	1500

26	138	277	692	1380
28	129	257	643	1290
30	120	240	600	1200
32	113	225	563	1125
34	106	212	529	1060
36	100	200	500	1000
37	97	195	486	970
38	95	189	474	950
39	92	185	462	920
40	90	180	450	900
41	88	176	440	880
42	86	172	430	860
43	84	167	420	840
44	82	164	410	820
45	80	160	400	800
46	78	157	391	780
47	77	153	383	770
48	75	150	375	750
49	73	147	367	730
50	72	144	360	720
51	71	141	353	710
52	69	138	346	690
53	68	136	340	680
54	67	133	333	670
55	65	131	327	650
56	64	129	321	640
57	63	126	316	630
58	62	124	310	620
59	61	122	305	610
60	60	120	300	600
62	58	116	290	581
64	56	112	281	562
66	54	109	273	545
68	53	106	265	530
70	51	103	257	515
72	50	100	250	500
74	48	97	243	485
76	47	95	237	474
78	46	92	231	462
80	45	90	225	450
82	44	88	220	440
84	43	86	214	430
86	42	84	209	420

88	41	82	205	410
90	40	80	200	400
94	38	76	192	383
98	37	74	184	368
100	36	72	180	360
104	35	69	173	346
108	33	67	167	333
112	32	64	161	322
116	31	62	155	311
120	30	60	150	300
130	28	55	138	277
140	26	51	129	257
150	24	48	120	240
160	22	45	113	225
170	21	42	106	212
180	20	40	100	200

Example: The Btu content of the gas is 500 Btu per cu ft. The burner input needed is 80,000 Btu. How many seconds should a 2 cu ft dial gas meter travel in one revolution?

Cubic feet needed equals 80,000/500 equals 160

From the above chart, the time should be 45 seconds.

When the above chart isn't at hand, there is another method that is used. Take the seconds that it takes for one revolution of the gas meter dial, and divide the seconds by the number of cubic feet of the dial to give the seconds for one revolution. Then divide 3600 (3600 seconds in an hour) by this figure. This gives the cubic feet of gas going into the furnace in an hour — furnaces are rated in Btu per hour. To find the Btu input, multiply the cubic feet per hour times the Btu content of the gas. This can be expressed by the formula:

Btu input equals 3600 x Btu per cu ft of gas/sec. per rev/cu ft of dial



Sealing the door



Inserting fire brick in the flue

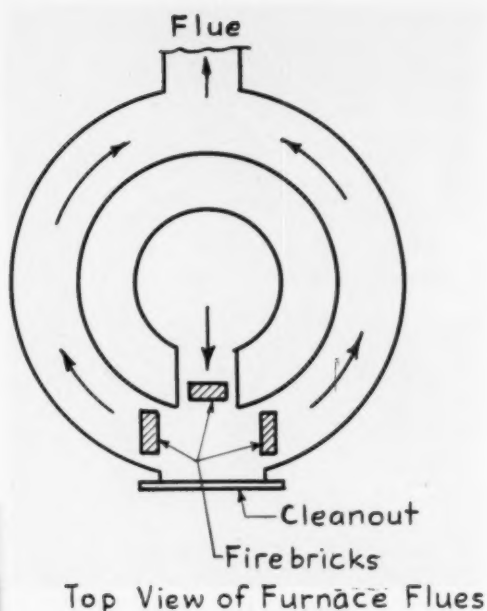
Example: The content of the gas is 1000 Btu per cubic foot, and a two cubic foot dial measures 90 seconds for one complete revolution. What Btu is going into the furnace?

$$\text{Btu} = \frac{3600 \times 1000}{90} = \frac{3,600,000}{45} = 80,000$$

Once the burner has been adjusted for the proper gas input, adjust the primary air opening. When the primary opening isn't opened enough, a yellow flame occurs which soon deposits carbon in the furnace. When it is opened too much, the burner flame lifts off the ports — thus, not all the gas is burned and a low efficiency results. Adjust the opening by closing the primary opening until a yellow flame appears. Then slowly open the air shutter until the yellow flame just disappears, and the burner has a soft blue flame.

There are two generally used methods of reducing chimney draft. However, both methods are sometimes used. The first method is to put fire bricks in the furnace flue. This causes the heat to scrub across the sides of the furnace and thus give more heat to the heat exchanger. The other method is to use a draft diverter with a decreased flue pipe. Here are the sizes that the gas company (natural gas) in Cleveland recommends, and they work out very well.

Input — Cu ft per hour	Draft hood and flue pipe size
up to 120	5 in.
120 — 180	6 in.



Front View of Bricks

Fig. 6



Match flame draws in up to catch

Flame blows out above catch



180 — 250	7 in.
250 — 320	8 in.
320 — 410	9 in.
410 — 510	10 in.

Draft Hood & Flue Pipe Sizes for Gas Conversion
Burners in Reversible Flue
Coal Furnaces and Boilers

Input — Cu Ft	Draft Diverter Sizes
up to 140	6 in.
140 — 190	7 in.
190 — 250	8 in.
250 — 320	9 in.
320 — 390	10 in.

Before an orsat test can be run, the furnace has to have time to warm up, usually about 10 minutes. Some servicemen eliminate any waiting period by calling the owner and telling him to turn up the furnace, because they will be right over.

While waiting for the furnace to get warm, cement around the edges of the clean-out door, fire door openings, etc. This will give more control to the secondary air opening adjustment.

Then you can roughly set the secondary air openings by cracking the fire door open about an eighth of an inch. After this is done, run a lighted match from the bottom of the open side of the door to the top. For a proper setting, the flame should be drawn in all the way to the fire door, and latch blown out from the latch to the top of the door. If the flame blows out below the latch, the secondary opening should be decreased. If it pulls in above the center of the door, the secondary air opening should not be closed more than $\frac{3}{4}$ the way. If this is necessary to get good efficiency, check the furnace for air leaks. Most of these air leaks can be detected by putting a match flame around all the openings. See photos. When there is a leak, the flame will be drawn toward the leak.



19th National Oil Heat Exposition

28th OHI Annual Convention

THE FIVE DAY Oil-Heat Institute convention and the concurrent National Oil Heat Exposition in Chicago, April 2-6, promises to be the most important in years in the opinion of industry leaders. During the five days, according to A. T. Atwill, OHI president, a blueprint for the entire industry for years to come may be established.

Overshadowing other subjects at the convention business sessions will be the question of oil heating operations in a defense economy. A round-robin survey of many industry leaders confirms the impression that the future pattern of oil heating equipment manufacturing and distribution will be set at the meetings. Manufacturers are virtually unanimous in stressing universal participation by industry members in making the decisions that will have a vital bearing on all levels of operation, from the local to the national.

Business Sessions

Business meetings will be held on Monday and Tuesday. On Monday morning the retiring OHI board will hold its final meeting; in the afternoon the Accessory Division will have its annual meeting and the Distribution Division its retiring board meeting. The annual meeting of the Distribution Division will be held Tuesday morning and its new board will have its first meeting in the afternoon. The institute's annual meeting, at which new officers and directors will be elected will take place Tuesday morning and immediately afterward the new OHI board will hold a luncheon meeting.

Tuesday, April 3, will be Engineering Day and a technical session

Exposition Hours

The exposition will be open to the industry and general public:

Monday, Apr. 2, 4 to 10 p.m.
Tuesday, Apr. 3, 1 to 10 p.m.
Wednesday, Apr. 4, 1 to 10 p.m.
Thursday, Apr. 5, 1 to 5 p.m.
Friday, Apr. 6, 1 to 8 p.m.

Industry Registration

Registration bonus:

Every 100th industry registrant will receive a special souvenir copy of the Handbook of Oil Burning.

along the lines of the highly successful meeting last year will be held in the afternoon at the Palmer House. L. N. Hunter, chairman of OHI's engineering committee, will preside at this session at which it is tentatively planned to cover substitutes for critical materials, burning heavy oils, and other timely subjects.

Industry Day

By tradition, Wednesday, April 4, will be Industry Day, and A. T. Atwill, the institute's president, will preside. This session will cover broad subjects of paramount interest to all levels of the industry. Material availability, government regulations, and fuel oil supply are among the subjects set for discussion at this meeting.

J. Howard Marshall, Vice Chairman, Ashland Oil & Refining Co., Ashland, Ky., who is also an advisor to the Petroleum Administration for Defense, will speak before the ses-

sion and provide answers to the question of fuel in a defense economy.

Paul K. Addams, chairman of the Accessory Division, will preside at a luncheon to be held at the Palmer House, Wednesday, April 4.

Charles G. Wright, well-known Chicago business economist and author, will address the group. Mr. Wright has been business economist at the Federal Reserve Bank of Chicago for the past four years. Previous to this he was economist for the Bureau of Labor Statistics, specializing in industrial classification, employment, and construction. He is a member of the American Economic Association and the American Statistical Association. Since 1948 he has been president of the Board of Education of Lombard, Ill.

Dealer Day

F. C. Haab, National Chairman, Distribution Division, will preside at the Dealer Day program, Thursday, April 5. At this session natural gas competition, the oil heat story, and fuel oil delivery will be aired from the dealer's point of view. C. T. Burg, Vice President, Iron Fireman Mfg. Co., Cleveland, Ohio, will give his well-known selling talk called Beware of the Three Bad Bogeymen.

Oil-Heat Institute of America will hold its annual banquet on Thursday evening, April 5, at the Palmer House. The program of entertainment (no speeches) will be by popular favorites of night club, stage, and television. This event will be preceded by a cocktail hour beginning at 6:00 p.m.

One of the social events of show week will be the annual dinner for



Impressive night view of Chicago skyline looking north from Adler Planetarium. Glitter of lights is reflected on the calm surface of Lake Michigan.

Program

members of the Old Timers Club. J. W. Owens, national chairman, announces this will be on Tuesday night, April 3. Secretary Maccubbin will announce the program at a later date.

Ladies who intend to be present at the convention will be interested to know that a diversified program of interesting activities is being planned for them. A committee of industry ladies, headed by Mrs. J. W. Owens and Mrs. W. A. Kemp, is in charge.

Handbook of Oil Burning

The new Handbook of Oil Burning will be on display at the OHI booth. Editorial contributions to the handbook were made by 54 industry specialists, each an expert in his field, making the book one of the most exhaustive and authoritative volumes ever published on the subject of oil burning. The handbook will contain over 900 standard textbook size pages, including 584 tables and illustrations.

A free copy will be given to every 100th trade registrant at the exposition. Lucky registrants will be determined by random pick from among each day's registration cards. Names of winners will be posted daily in the OHI booth.

MONDAY, APRIL 2

- 9:00 a.m. OHI Show Committee Meeting
- 10:00 a.m. Retiring OHI Board Meeting
- 10:00 a.m. Ladies' Registration
- 1:30 p.m. Annual Meeting — Accessory Division
- 1:30 p.m. Retiring Board Meeting, Distribution Division
- 3:00 p.m. Show Committee Inspection — OHI office, Navy Pier
- 4:00 p.m. Opening Ceremony, 19th National Oil Heat Exposition
- 4:00 p.m. Registration at Exposition
- 4:15 p.m. Press Reception
- 10:00 p.m. Exposition Closes

TUESDAY, APRIL 3 ENGINEERING DAY

- 9:00 a.m. Annual Meeting — Distribution Division
- 10:00 a.m. Annual Meeting OHI of America
- 10:00 a.m. Ladies' Registration
- 12:30 p.m. New OHI of America Board Luncheon Meeting

- 1:00 p.m. Exposition Opens
- 2:00 p.m. Engineering Session — Palmer House
- 2:30 p.m. New Distribution Division Board Meeting
- 10:00 p.m. Exposition Closes Old Timers' Dinner

WEDNESDAY, APRIL 4 INDUSTRY DAY

- 9:30 a.m. Industry Session
- 10:00 a.m. Ladies' Registration
- 1:00 p.m. Accessory Division Luncheon
- 1:00 p.m. Exposition Opens
- 5:00 p.m. Chapter Secretaries' Dinner Meeting
- 10:00 p.m. Exposition Closes

THURSDAY, APRIL 5 DEALER DAY

- 9:30 a.m. Dealer Session
- 1:00 p.m. Exposition Opens
- 5:00 p.m. Exposition Closes
- 6:00 p.m. General Cocktail Hour
- 6:00 p.m. Board Reception
- 7:30 p.m. OHI Annual Banquet & Entertainment

FRIDAY, APRIL 6

- 1:00 p.m. Exposition Opens
- 8:00 p.m. Exposition Final Closing

List of Exhibitors

Here are the names of exhibitors at the 19th National Oil Heat Exposition, Navy Pier, Chicago, April 2-6. In most cases the personnel in attendance and products on display are listed. All exhibitors and booth numbers are included for convenience.

ACE ENGINEERING CO., 1435 W. 15th St., Chicago 8, Ill.—Booth 106.

ALDRICH CO., Wyoming, Ill.—Booths 225-227.

In attendance: P. M. Stephenson, B. Mulder, E. L. Fox.
Exhibiting: Special, Bantam, and Series B boiler-burner units, oil burners.

AMERICAN ARTISAN, 6 N. Michigan Av., Chicago 2, Ill.—Booth 327.

In attendance: John E. Peterson, W. J. Osborn, R. A. Jack, Geo. C. Cutler, Charles E. Price, J. D. Thomas, J. J. McCullough.

Exhibiting: American Artisan, technical books, market data.

AMERICAN CLAY FORMING CO., Tiffin, Ohio.—Booth 125.

AMERICAN RADIATOR & STANDARD SANITARY CORP., P. O. Box 1226, Pittsburgh 30, Pa.—Booths 150-151-152.

In attendance: H. L. Spindler, H. C. Day, Kenneth MacKenzie, J. J. Cambal, P. W. Vieth, C. D. Hornby, J. C. Mammoser, C. M. Crothers, W. C. Krugman, H. F. Beglen.

Exhibiting: Winterway winter air conditioners, Arcoliner boilers, Arcoflame oil burners.

New Products: Magne-filter air cleaner.

ARMSTRONG MACHINE WORKS, Three Rivers, Mich.—Booth 464.

AUTOMATIC DEVICES CO., INC., 714 Hillgrove Av., Western Springs, Ill.—Booth 467.

In attendance: H. T. Kudera, E. Barto, A. Rutherford, C. Churchill, Gordon Reynertsen, D. W. Dobson, M. M. Hynes, C. Schuettenberg, Brooks Morris, E. A. Hartnett.

Exhibiting: Weather-Man outdoor controls, Weather-Chron time switches.

BACHARACH INDUSTRIAL INSTRUMENT CO., 7000 Bennett St., Pittsburgh 8, Pa.—Booth 402.

In attendance: John W. Smith.

Exhibiting: Instruments for combustion testing and for balancing of heating systems.

ROBERT BARCLAY, INC., 122 N. Peoria St., Chicago 7, Ill.—Booths 434-435.

In attendance: Milton K. Arenberg, Laurence P. Felker, Barton Geldigan, Richard Collins, Emerson Spires, Dan Collins, Tom Treacey, L. X. Frost.
Exhibiting: Oil burner supplies, controls, and pumps.

New Products: Two-Tank-T oil filters, oil tank valves.

BELL & GOSSETT CO., 8200 N. Austin Av., Morton Grove, Ill.—Booths 259-260.

In attendance: E. J. Gossett, R. E. Moore, C. E. Pullum, R. A. Patterson, W. A.

Boone, Frank C. Hackett, Chet Towns, Wm. Warner.

Exhibiting: Hydro-Flo heating products.
New Products: Outdoor temperature control.

BREUER ELECTRIC MFG. CO., 5100 N. Ravenswood Av., Chicago 40, Ill.—Booth 160.

CENTURY ENGINEERING CORP., 401 Third St., S.E., Cedar Rapids, Iowa.—Booths 444-445-446.

In attendance: B. J. Lattner, J. O. Rosche, Jack Stites, Ray F. Considine.

Exhibiting: Oil burners, oil fired furnace units.

New Products: Oil fired gravity furnace unit.

CHRYSLER AIRTEMP DIVISION, CHRYSLER CORP., 1600 Webster St., Dayton 1, Ohio.—Booths 462-463.

CLEAVER-BROOKS CO., 326 E. Keefe Av., Milwaukee 12, Wis.—Booths 442-443.

In attendance: J. V. Resek, Frank M. Wymbs, Howard J. McCoy.

Exhibiting: Hev-E-Oil burners, AMH-5 Hev-E-Oil burner.

New Products: Wisco oil-air pump for low pressure domestic oil burners, burners for burning No. 5 oil.

COLE-SEWELL ENGINEERING CO., 2288 University Av., St. Paul 4, Minn.—Booth 115.

In attendance: E. W. Laudert, S. H. Burt, H. J. Sewell.

Exhibiting: Cole draft governors, Draft Korectors.

COMBUSTION CONTROL CORP., 77 Broadway, Cambridge 42, Mass.—Booth 257.

In attendance: J. A. Long, B. E. Shaw, L. D. Sibley, S. J. Pachyn, H. Christiansen.

Exhibiting: Flame failure safeguards and controls for oil, gas, and combination gas-oil burners.

New Products: Fireeye programming control, Firetron flame scanner, Fireeye flame failure safeguard system, Fireeye multiple scanner flame failure control.

COMBUSTIONEER DIV., STEEL PRODUCTS ENGINEERING CO., 1205 W. Columbia St., Springfield, Ohio.—Booth 208.

In attendance: Georges Roudanez, E. M. May, C. L. Brooks, V. C. Page, R. F. Kissell, H. E. Gahnz, P. H. Chamberlain, R. O. Hedges, D. L. Getz.

Exhibiting: Low pressure oil burners, oil fired furnaces, high pressure oil burners, humidifier.

New Products: New low pressure oil burner.

COMMERCIAL FILTERS CORP., 18 W. 3rd St., Boston 27, Mass.—Booth 427.

In attendance: J. R. Chisholm, P. R. Matravers, William A. Rose.

Exhibiting: Fullflo filters.

New Products: Filters for bulk plant and dispensing truck for fuel oil and diesel fuel oils.

DELAVAN MFG. CO., 3007 Sixth Av., Des Moines 13, Iowa.—Booths 157-158.

In attendance: Nelson B. Delavan, David T. Morgenthauer, Eugene O. Olson, H. L. McNally.

Exhibiting: Oil burner nozzles and accessories, sludge solvent, Hally nozzle filters.

DELCO APPLIANCE DIV., GENERAL MOTORS CORP., 391 Lyell Av., Rochester 1, N. Y.—Booth 305.

In attendance: Stuart J. Rice, Jr., J. R. Williams, J. F. Warren, A. C. Freimann.
Exhibiting: Conversion oil burners, oil fired Conditionairs, oil fired boilers.

DIELECTRIC PRODUCTS CO., 125 Virginia Av., Jersey City 5, N. J.—Booth 124.

DOLE VALVE CO., 1901 W. Carroll Av., Chicago 12, Ill.—Booths 453-454.
In attendance: J. F. Lund, H. H. Aronson, W. G. Pennington, R. S. Singers, S. G. Phillips.

Exhibiting: Air and vacuum valves, water mixers, flow control valves, thermostatic air control, No. 20 automatic hot water air valves.

New Products: Chamber-vents.

DONGAN ELECTRIC MFG. CO., 2987 Franklin St., Detroit 7, Mich.—Booth 126.

In attendance: Lyle J. Hicks, K. I. Clisby, C. E. Hicks, J. B. Evans.

Exhibiting: Transformers.

EDDINGTON METAL SPECIALTY CO., P. O. Box K, Eddington, Pa.—Booth 336.

In attendance: Wesley Czarnecki, Walter Czarnecki, Casimer Czarnecki, Stanley Czarnecki, Vince Devine, Walter Stamberger.

Exhibiting: Nozzles, filters, strainers, air cones, stabilizers.

New Products: Fuel oil filter.

ELECTROL BURNER MFG. CO., INC., 22 Union Av., Rutherford, N. J.—Booths 145-146.

In attendance: R. F. Andler, L. W. Schroeder.

Exhibiting: Oil heating equipment.

ENTERPRISE ENGINE & MACHINERY CO., 18th & Florida Sts., San Francisco 10, Calif.—Booth 137.

In attendance: J. Neil Brophy, C. A. Louderback, V. M. Douglas.

Exhibiting: Combination gas and oil burners, metering pump.

FIELD CONTROL DIV., H. D. CONKEY & CO., Mendota, Ill.—Booth 130.

In attendance: Earle A. Smith, Lee N. Beardsley, C. W. Potter, George Peterson, Paul Jett, Fay Kinne.
Exhibiting: Barometric draft controls.

FITZGIBBONS BOILER CO., INC., 101 Park Ave., New York 17, N. Y.—Booth 431.

In attendance: Paul K. Addams, R. C. Malvin, G. E. Olsen, John R. Collette, Gilbert Nelligan.
Exhibiting: Boiler-burner units, boilers.

FLUID HEAT DIV., ANCHOR POST PRODUCTS, INC., 6500 Eastern Ave., Baltimore 24, Md.—Booth 249.

In attendance: M. J. Donahue, D. G. Knowles, C. R. Holstren, W. S. Howland, H. E. Johnston, J. H. Peterson.
Exhibiting: Conversion burners, forced air furnaces, burner boiler units, warm air furnaces.

FRAM CORP., Providence 16, R. I.—Booth 105.

In attendance: E. L. Sandberg.
Exhibiting: Domestic oil burner filters and cartridges.

GENERAL AUTOMATIC PRODUCTS CORP., 2300 Sinclair Lane, Baltimore 13, Md.—Booths 107-108-109.

In attendance: H. F. Browning, C. E. Hight, R. E. Lee, C. E. Birch, C. W. Schaefer, H. J. Hughes.
Exhibiting: Floorlevel baseboard radiation, winter air conditioners, conversion oil burners, boiler-burner units.
New Products: Boiler-burner units.

GENERAL ELECTRIC CO., Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.—Booth 220.

In attendance: C. R. Olsen, W. L. Snelts, R. P. Schaeffer, E. E. Burrit, E. V. Whiteley, H. L. Beurlle, I. P. Sharpe, G. W. Hart, R. H. Stearns, A. C. Kretschmar, J. G. Mooney, A. K. Tower.
Exhibiting: Model LB oil fired furnace and cutaway, Model LA oil fired boiler and cutaway, clock thermostat, automatic air wall register, year round air conditioner.
New Products: Clock thermostat, automatic air wall register, year round air conditioner.

GENERAL ELECTRIC CO., Apparatus Dept., 1 River Rd., Schenectady 3, N. Y.—Booth 264.

In attendance: C. J. Ossenfort, F. A. Ondrovick, C. J. Monroe, B. S. Day, L. R. Spicer, B. A. Feldman, L. R. Brickey.
Exhibiting: Oil burner control equipment, oil burner motors, oil burner ignition transformers.
New Products: Automatic recycling oil burner control.

GENERAL FILTERS, INC., 12890 Westwood Ave., Detroit 23, Mich.—Booth 244.

In attendance: Mrs. Grace Redner, Robert G. Gregorv, Roland A. Redner, L. E. Schulein, W. B. Forrest, Les Sheldon, Wayne M. Davis, T. C. French, V. B. Kathe, Gene Grasse, Steve Dunn, R. B. Milholland, Wally Hirsch.
Exhibiting: Fuel oil filters, industrial filters.

GILBERT & BARKER MFG. CO., Cold Spring Ave., West Springfield, Mass.—Booths 417-418-419.

In attendance: J. A. MacDonnell, H. J. Lanyon, H. K. Ricker, R. B. White,

E. J. Walters, D. F. Gray, G. B. Baan, W. N. Heseltine, L. A. Doremus.

Exhibiting: Oil burners, surface type air conditioners, boiler burner units, suspended furnaces.

GULF OIL CORP., Gulf Bldg., Pittsburgh 19, Pa.—Booths 127-128.

In attendance: C. E. Kramb, A. V. Harris, L. A. Devlin, Jr.
Exhibiting: Heating oils.

HARVEY-WHIPPLE, INC., 2155 Columbus Ave., Springfield, Mass.—Booths 133-134-135-136.

In attendance: Ray G. Whipple, T. A. Hodgdon, Leon Turner, A. E. Brown, Lowell B. Meinerz, L. W. Shaw, Bennett T. Church, W. C. Dee.
Exhibiting: Master Kraft oil heating equipment.
New Products: Suspended furnaces, portable heaters.

HEIL CO., 3000 W. Montana St., Milwaukee 1, Wis.—Booths 216 & 316.

In attendance: H. F. Pugh, A. Meyer, George Hochstein, J. F. Heil, Jr., Wm. Chester, Jr., Roy King, Herman Wagen, Fred Brubaker, D. Cunningham, Karl Mould, D. E. Fricker, W. E. Simons, J. F. Heil, K. F. Johnson.
Exhibiting: Oil heating equipment.

HOOVER CO., KINGSTON-CONLEY DIV., 68 Brook Ave., North Plainfield, N. J.—Booth 141.

In attendance: A. E. Ott, C. P. Williams.
Exhibiting: Electric Motors.

IRON FIREMAN CORP., 3170 W. 106 St., Cleveland 11, Ohio.—Booth 201.

In attendance: C. T. Burg, Dale Wylie, H. M. Cuthshaw, S. H. Kibbe, W. J. O'Neil, Howard B. Evans.
Exhibiting: Domestic high pressure oil burners, furnaces, boilers, commercial oil burners and oil-gas burners.

JACKSON & CHURCH CO., 321 N. HAMILTON, Saginaw, Mich.—Booth 205.

In attendance: Clifford C. Stuart, L. S. Redford, F. C. Adams, C. J. Low, J. B. Winston, Neil Reisdorph, A. E. Duwe.
Exhibiting: Suspended and Poweraire units.
New Products: Oil fired heating equipment.

JEFFERSON ELECTRIC CO., Bellwood, Ill.—Booth 122.

In attendance: C. T. Hartnett.
Exhibiting: Oil burner ignition transformers.

JOHNSON CO., S. T., 940 Arlington Ave., Oakland 8, Calif.—Booths 101-102-103.

In attendance: J. C. Johnson, R. P. Johnston, A. Dimick, W. S. Harlacher, W. Thoms, W. Lees, E. E. Jensen, Daniel E. Johnson.
Exhibiting: Heavy duty commercial oil burners, residential oil burners, water heaters, furnaces.

New Products: Aerolux high boy furnace burner unit.

KENT CO., INC., 435 Canal St., Rome, N. Y.—Booth 149.

In attendance: C. E. Clifford, J. W. Jones, George Davis.
Exhibiting: Double suction furnace and boiler cleaner.

KEWANEE BOILER CORP., Franklin St. & Q Tracks, Kewanee, Ill.—Booths 251-253.

In attendance: J. M. Hartman, Earl Thompson, Grover Zang, Ralph E. Sjoberg, C. F. Olsen, W. E. Foksett, R. E. Wicklander, Pete Irwin, J. W. Carr, Fred R. Desidero.
Exhibiting: Steel boilers.

KLEMM AUTOMOTIVE PRODUCTS CO., 1718 N. Damen Ave., Chicago 47, Ill.—Booth 129.

In attendance: E. R. Klemm, Jr., C. B. Wilson, Gerry Wieland, Al Gruelich, Dave Savitzky, Robert Smiley.
Exhibiting: Fuel oil filters.

KO-Z-AIRE, INC., 401 Coolbaugh St., Red Oak, Iowa.—Booths 138-139.

In attendance: J. J. Hildebidle, R. T. Demarest, G. Johnson, L. White, L. Krause, D. Banner, D. Porter, M. Taylor.
Exhibiting: Forced air and gravity warm air furnaces.
New Products: Oil fired counterflow furnace.

LITTLE BURNER CO., INC., H. C., Woodland Av. & Dubose St., San Rafael, Calif.—Booth 175.

LYNN PRODUCTS CO., 17 Willow, Lynn, Mass.—Booth 457.

In attendance: Edwin K. Priest, Lawrence H. St. Jean.
Exhibiting: Pressure atomizing burners.
New Products: Spiral-Ex head which burns 100 per cent catalytic fuel oil without smoke.

MCDONNELL & MILLER, INC., 3500 N. Spaulding Ave., Chicago 18, Ill.—Booths 447-448.

In attendance: E. N. McDonnell, Nils W. Swanson, George La Roi, Leo Kmiecik, John James, Charles Bottger, Dick Flickinger, Gene Eggers, J. W. Ramsay, Howard Peary, Parker Devlin.
Exhibiting: Safety devices for steam and hot water boilers, safety relief valves for hot water heaters and hot water storage tanks, special application products.
New Products: Safety relief valves for hot water heaters and domestic storage tanks.

MERCOID CORP., 4201 Belmont Ave., Chicago 41, Ill.—Booths 421-422.

In attendance: Hugh Courteol, I. E. McCabe, J. W. Owens, R. F. Fisher, W. L. Coulterjohn, William Ufer, Walter J. Schett, Edward Haas, W. E. Jones, P. P. Sloss, J. F. McCauley, Paul J. Provost.
Exhibiting: Automatic controls for oil heating.

METROMATIC MFG. CO., 15 Henderson St., Everett 49, Mass.—Booths 142-143-144.

In attendance: B. W. Cosentino, Wendell F. Austin, Fred DeAngelo, Frederick Nalley, George C. O'Connor, Albert J. Axman, Robert W. Pyne.
Exhibiting: Metropac furnaces and oil burners.

MINNEAPOLIS-HONEYWELL REGULATOR CO., 2753 4th Ave., S., Minneapolis 8, Minn.—Booths 404-409.

In attendance: T. McDonald, A. H. Lockrae, K. L. Wilson, H. F. Chapler, C. C. Cochran, H. E. Williams, A. Michelson, W. J. Brown, T. A. Reed, D. J. Peterson, J. Dorsey, W. W. Martens, J. Trace, G. Hayes, F. Bell.
Exhibiting: Moduflow, Chronotherm, industrial and domestic oil burner controls.
New Products: Delayed opening oil valve, dribble proof valve.

MONARCH MFG. WORKS, INC., 2501 E. Ontario St., Philadelphia 34, Pa.—Booth 460.

In attendance: E. R. Frame, J. C. Underwood, C. E. Fink, W. M. Fink.
Exhibiting: Oil burner nozzles, combustion heads, air mixing equipment.
New Products: Combustion head.

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--

MORSE-SMITH-MORSE, Inc., 165 Dexter Av., Watertown 72, Mass.—Booth 116.

In attendance: John C. Dieselman, Robert E. Chase.

Exhibiting: Fireomatic safety valves, tank gauges, filters, vent caps, thermal switches.

OIL-HEAT INSTITUTE OF AMERICA, 6 E. 39th St., New York 16, N. Y.—Booth 100.

PENN ELECTRIC SWITCH CO., Goshen, Ind.—Booths 455-456.

In attendance: R. V. Clark, Carlos Morgan, H. C. Shilling, R. Fletcher, E. A. Price, E. B. Maire, J. G. Moravec, M. E. Henning, B. H. Luscombe, F. X. Fessler, A. W. Barr, Jud Forbes, K. W. Cash, R. S. Penn, George Sander, R. L. Ratliff, R. L. Persons, A. L. Rubel, H. O. Gray, Emile Tassin, Adolph Korte.

Exhibiting: Automatic Heating controls. New Products: Dual Liquid Expansion Immersion Control.

PERFEX CORP., 500 W. Oklahoma Av., Milwaukee 7, Wis.—Booths 428-429-430.

PREFERRED UTILITIES MFG. CORP., 1860 Broadway, New York 23, N. Y.—Booths 112-113.

QUAKER MFG. CO., 223 W. Erie, Chicago 10, Ill.—Booth 401.

In attendance: O. J. Long, O. B. Nelson, Harry Schallman.

Exhibiting: Oil space heaters, oil floor furnaces.

New Products: Oil floor furnaces.

QUIET-HEET MFG. CORP., 135 N.J. R.R. Ave., Newark 5, N. J.—Booth 140.

In attendance: S. L. Peters, H. M. Spitzer, S. L. Sloan, E. N. Sloan.

Exhibiting: Oil burners, sump pumps.

RCS TOOL SALES CORP., 25 N. Ottawa St., Joliet, Ill.—Booths 459-460.

In attendance: Francis S. Russell, Thomas M. Sweeney, Dale D. Davis, Carl A. Longanecker.

Exhibiting: Super Saw with specially designed blades.

RADIANT UTILITIES CORP., 8817 18th Av., Brooklyn 14, N. Y.—Booth 436.

In attendance: Jacob G. Goldberg, Joseph Bloom, Julius S. Goldberg, Arthur A. Marcus.

Exhibiting: Oil burners.

RAJAH CO., 53 Locust Av., Bloomfield, N. J.—Booth 123.

In attendance: Robert A. Bell, Arthur H. Bell, Ernest W. Law.

Exhibiting: Terminals and tools.

RAY OIL BURNER CO., 401-499 Bernal Av., San Francisco 12, Calif.—Booth 440.

In attendance: Russell C. Westover, Jr., Carl Draper.

Exhibiting: Combination gas-oil burner.

New Products: Combination gas-oil burner.

ROCHESTER MFG. CO., INC., 100 Rockwood St., Rochester 10, N. Y.—Booth 450.

In attendance: C. L. Hastings, John Daley, Lawrence Donavon, V. E. Dunning, R. W. Hall, William Chase, John W. Ker-shaw.

Exhibiting: Test kits, vacuum and pressure gauges, industrial thermometers.

SCULLY SIGNAL CO., 88 First St., Cambridge 41, Mass.—Booth 314.

In attendance: Frank Scully, Carl Goddard, Arthur Gray, William Rowell, John Urbain, Eugene Murphy.

Exhibiting: Ventalarm signal, Ventalarm gauge combination, Fassill connectors, Remotomatic control, gauges.

New Products: Remotomatic control.

SHELL OIL CO., 50 W. 50th St., New York, N. Y.—Booth 344.

In attendance: J. L. Minner, C. M. Mockler.

Exhibiting: Shell fuel oil.

SPARKLER MFG. CO., Lake & Division Sts., Mundelein, Ill.—Booth 121.

In attendance: A. C. Cracklauer, F. W. Leuthesser.

Exhibiting: Fuel oil filters.

STRATTON & TERSTEGGE CO., ANCHOR DIVISION, New Albany, Ind.—Booth 214.

SUN-RAY BURNER MFG. CORP., 139-24 Queens Blvd., Jamaica 2, N. Y.—Booths 424-425-426.

In attendance: Gabe M. Marin, Alfred Luft, Martin Sones.

Exhibiting: Conversion oil burners.

New Products: Conversion oil burners.

SUNDSTRAND ENGINEERING CO., 1325 Seventh St., Rockford, Ill.—Booth 420.

In attendance: R. H. Gustafson, E. M. Smith.

Exhibiting: Domestic oil burners.

SUNDSTRAND MACHINE TOOL CO., 2421 Eleventh St., Rockford, Ill.—Booth 325.

In attendance: L. H. Schuette, C. W. Lang, R. J. Murphy, B. L. Douglass, J. F. Nelson, J. F. Griffey, O. E. Mayfield, R. E. Stevens, W. R. Kiefer, F. J. Kammeraad, B. F. Olson, R. W. Erikson, J. M. Kjellstrom, W. G. Jarvis.

Exhibiting: Oil burner pumps and fuel units.

New Products: Single stage and two stage fuel units with and without solenoid.

SUPER ELECTRIC PRODUCTS CORP., 46 Oliver St., Newark 5, N. J.—Booth 437.

In attendance: Charles Rapiport, George Eulo.

Exhibiting: Oil burner ignition transformers.

SWIRLING HEAT CORP., 2818 N. Washington Blvd., Arlington, Va.—Booth 159.

TACO HEATERS, INC., 137 South St., Providence 3, R. I.—Booth 117.

In attendance: J. Balter, R. T. Schoerner, E. T. Houlihan, J. R. Murphy.

Exhibiting: Hot water heating specialties.

THATCHER FURNACE CO., Center St., Garwood, N. J.—Booths 212 and 312.

In attendance: R. M. Cook, M. C. Beard, D. J. Turner, F. W. Sieffert, J. C. Meehan, L. Baughman.

Exhibiting: Oil fired furnaces, conversion oil burners.

New Products: Oil fired counterflow hi-boy furnace.

TIMKEN SILENT AUTOMATIC DIV., Timken-Detroit Axle Co., Box 56, Roosevelt Station, Detroit 32, Mich.—Booths 232-332.

TORIDHEET DIV., CLEVELAND STEEL PRODUCTS CORP., 7306 Madison Av., Cleveland 2, Ohio.—Booths 351-353.

In attendance: W. J. Smith, Jr., R. J. Lucas, D. W. Rouse, L. F. Dienst, W. F.

Schickler, H. M. Soyster, D. C. Hildebrecht.

Exhibiting: Oil burners, furnace-burner units, boiler-burner units.

TORRINGTON MFG. CO., 70 Franklin St., Torrington, Conn.—Booths 438-439.

In attendance: Donald G. Leslie, Fairfax R. Wheelan, Roger T. Lyman.

Exhibiting: Airstocrat fan blades, Airstor blower wheels, Coasting Hub.

TURBO-TUBE FURNACE, INC., 106 Kingsley St., Buffalo, N. Y.—Booth 166.

In attendance: J. B. W. Carmichael, A. H. Dann, Don Carmichael, H. J. Carmichael.

Exhibiting: Oil burning furnaces, oil burners.

TUTHILL PUMP CO., 939 E. 95th St., Chicago 19, Ill.—Booth 120.

In attendance: G. B. Tuthill, H. T. Kessler, J. D. Young, W. J. Wagner, W. F. Rye.

Exhibiting: Rotary oil pumps for domestic and industrial oil burners.

U. S. MACHINE CORP., North C St., Lebanon, Ind.—Booths 413-414-415-416.

In attendance: Claude A. Potts, Walter E. Blake, Herman E. Winkler, Philip C. Kosch, Robert C. Hulse, Norman J. Gill, Joe F. Witt.

Exhibiting: Low and high pressure oil burners, oil fired furnaces, oil fired boilers.

New Products: Oil fired furnace for gravity forced air utility or counter-flow installations.

WATTS REGULATOR CO., 10 Embankment St., Lawrence, Mass.—Booth 245.

In attendance: Cyrus S. Gates, B. G. Robertson, R. W. Giffin, Mike Mercury, Tony Mercury, Steve Fitzgerald.

Exhibiting: Temperature and pressure relief valves, pressure reducing valves, pressure relief valves and regulators.

New Products: Boiler safety relief valves.

WEBSTER ELECTRIC CO., 1900 Clark St., Racine, Wis.—Booth 235.

In attendance: B. T. Wiechers, J. H. Lahey, H. B. Hastings, Paul Maurice, Louis Ehrich.

Exhibiting: Fuel units, transformers, instantaneous cutoff units, Thermodrive.

WHITE-RODGERS ELECTRIC CO., 1209 Cass Av., St. Louis 6, Mo.—Booths 131-132.

In attendance: J. Newman, J. Rodgers, Jack Searls, Ed Robinson, R. Sherer, John Jung, G. Gibson, J. Murphy, Deane Eggert, R. Weber, P. Williams, W. Chesbro, L. F. Blough, Arnold Petersen, C. Garner, C. Rennecamp.

Exhibiting: Automatic controls for oil heat including thermostats, warm air controls, hot water and steam controls and primary oil burner, relays, and stack switches.

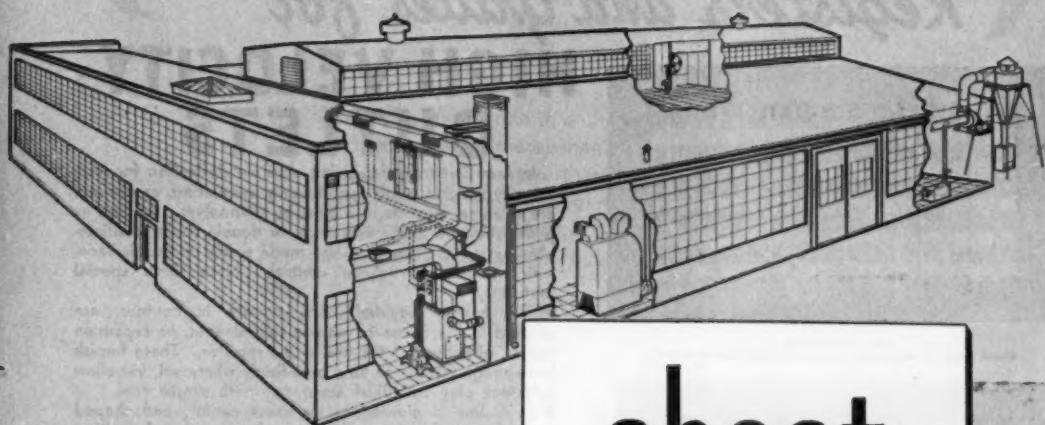
New Products: Primary oil burner controls.

WILLIAMS OIL-O-MATIC DIV., FUREKA WILLIAMS CORP., 1201 E. Bell St., Bloomington, Ill.—Booths 228-229-328-329.

Exhibiting: Winter air conditioning units, boiler-burner units, conversion burners.

New Products: Low pressure Oil-O-Matic featuring metered low pressure. Oil-O-Matic steel boiler-burner units for domestic application.

YORK-SHIPLEY, INC., York, Pa.—Booths 240-240.



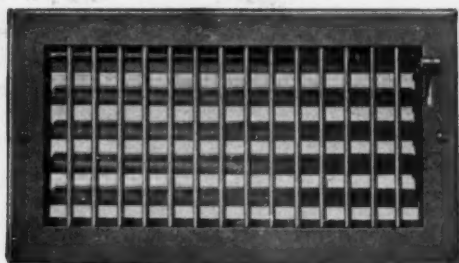
sheet metal *Section*

*Design • fabrication • installation
of sheet metal products*

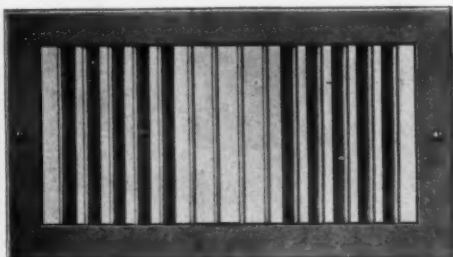
(AUER "Streamliners"

*Rank with the very finest in
Registers and Grilles for*

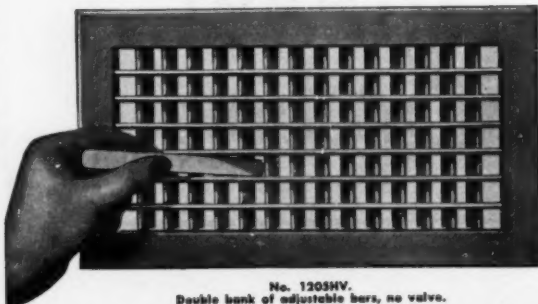
HIGH VELOCITY OUTLETS



No. 100SV-HML.
Single bank of adjustable bars, with multi-louvre valve.



No. 100SV.
Single bank of adjustable bars, no valve.



No. 120SHV.
Double bank of adjustable bars, no valve.

In fact Streamliners, giving multiple deflection for high velocity systems of air conditioning, ventilating, or cooling, are in some respects in a class by themselves. For use as grilles they are made with single or double banks of adjustable bars. Registers are also made single or double face, with multi-louvre volume control. Note these special features:

- The hollow moulded bars, smooth in contour, are pivoted in the frame on unique split sleeves, or expansion inserts, effective for the life of the register. These furnish just enough tension to hold bars firmly where set, yet allow sufficient play to adjust accurately with simple tool.
- Each bar is pivoted in its exact center, and shaped somewhat similar to an airplane wing, so that for either return or supply, each bar can be completely turned around. For outlets, some users turn the thin edge to the front, and the broader edge toward the flow of air, thus using a basic theory of aerodynamics, and reducing resistance and turbulence to a minimum.
- Blades of multi-louvre volume control are pivoted on tension rivets to guard against vibration or noise, another important feature. These registers are absolutely quiet even at high velocities.
- There is nothing, so far as we know, to wear out, pull loose, or give way in service, in a Streamliner.

8 MODELS. The Series includes models with single bank of adjustable bars (vertical or horizontal), also with double bank of adjustable bars (vertical in front and horizontal in back, or the reverse), also all above four types with the addition of horizontal multi-louvre valves in the rear, controlled by lever on face of register.

Ask for Bulletin S-50. For forced air or gravity registers, we will send you complete Auer Register Book—for perforated grilles, Catalog "G".

THE AUER REGISTER CO., 6600 CLEMENT AVENUE, CLEVELAND 5, OHIO
CANADIAN DISTRIBUTOR, MARCHAND FURNACE, LTD., TILBURY, ONT.

Auer

REGISTERS

& GRILLES for AIR CONDITIONING & GRAVITY

Fundamentals Of Sheet Metal Practice

CHARLES SEEL

Alexandria, Va.

This is the first article in an interesting new series on work in the sheet metal shop. The author has been in the industry for more than 40 years and his viewpoint is that of the practical man who has also taught the subject. His presentation is very basic and he analyzes each subject thoroughly.

Foreword

THE AUTHOR MAKES NO CLAIM to be the originator of everything treated in this manual. Instead he acknowledges his indebtedness to those persons skilled in sheet metal work with whom he has been associated for almost 40 years. Many of these men have passed away, but a number are still with us.

This text is written for those who come into the sheet metal trade and wish to benefit by methods learned from others, devised and used by the author, always bearing in mind that old proverb: There are always three ways to do a job; your way, my way, and the best way.

Handling and Carrying Sheets

As we are dealing primarily with galvanized steel sheets, we begin with handling the bundle and the sheet.

At the beginning of the author's apprenticeship, one of the first things learned was how to drop a bundle of sheets off a wagon, as there were no motor trucks then. We learned that to prevent the entire bundle from being buckled about 2 ft from the end, it is necessary to give the bundle a quick pull or jerk just as the end is about to drop, and let the end slap down on the floor. It is advisable always to use gloves when doing this.

The bands are then removed either by curling the bundle lengthwise and slipping the band off the top edge; bending down to the floor and twisting it off by stepping on it, or by lifting the end of the band with a peen hammer (the bundle in this case being flat on the floor) straightening it out and driving to clear the other

end. The sheets are then placed in racks, in piles, or stacked against a wall.

To carry a sheet, if not too heavy for one man, stand it up on edge, grasp it in both hands with the hands about 3 to 3½ ft apart, lift it about an inch or so from the floor, or let it slide long the floor if possible, and so move it to the bench. With the sheet between you and the bench, lift it high enough to have more metal above the bench top than below, and let the sheet fall away from you. This procedure is better than taking the sheet by the end and dragging it across the floor and lifting onto the bench.

With heavier sheets, requiring two men, the use of hooks made of strap iron, or clamps, or other special holders is especially suitable.

The sheet is made ready for layout by noting the cleaner side and placing this side either up or down, depending on which is to be the inside or outside of the finished piece. The usual method is to have the cleaner side down. Mark the upper surface XX or with the symbol I/S(inside) or O/S(outside) whichever is appropriate.

Ready for Layout

Being ready now to lay out a pattern, have the following implements at hand:

- 1) A scribe with a fine, hard point. A good one with a small knob handle may be purchased in local stores.
- 2) A sharp pointed prick punch to mark rivet holes and bend dots up to 20 gauge, and a center punch.

- 3) A mallet, which is better and safer than a hammer.
- 4) A 2 ft carpenters square for large sheets and a combination square for small work.
- 5) A 6 ft flexible tape rule. Since this may be hooked on the end of a sheet, it is useful for measurements.
- 6) A hinged, 6 ft aluminum rule. One of these rules at a dollar will outlast 5 or 6 wooden ones.
- 7) Several straight edges, preferably a 3 ft and 4 ft, and if there is no 8 ft shears for trimming edges, an 8 ft one.

When examining the sheet, buckles may be found in it. To remove these, grasp the corner of the sheet with one hand and curl the corner up at an angle of 45 deg. at the same time rubbing it with the other hand. Repeat on other corners until buckles are removed.

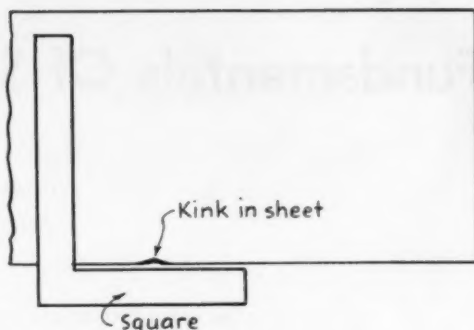
Actual Layout

We are now ready to lay out the pattern. It is best to start at the top of the sheet, which is the smooth end. The bottom end is rough, as it is the end from which molten zinc drips after the sheets are lifted out of the galvanizing tank.

Make a slight kink at the edge of the sheet by placing the end of the punch under the sheet and bending the edge up a little. This enables you to engage the edge of the square so it will not slip. The kink can easily be dressed smooth later. Scribe a line near the left end, remove the square, trim off and then measure the required length with a tape rule and make another kink about a foot short of this mark. Place the square in position and scribe a line across the sheet, tipping the scriber away from the square slightly in order to secure an accurate mark.

The sheet is then cut at the required line. If a number of pieces are to be marked, the sheet being used as a pattern is dropped edgewise to the floor and leaned against the bench. The next sheet is lifted to the bench as already noted, the pattern placed on top, and the second sheet marked, cut, and moved away.

A pattern is generally marked 5 more when 6 pieces are required and the pattern itself is to be used. When the pattern is to be saved for future use, it is marked 6 of, or 6 off, meaning that the pattern piece is to be used again.



When a long sheet has been marked off and is to be lifted from one bench to another nearby, some men grasp it like a man carrying a flag pole, that is by holding one edge against the body and curling the sheet lengthwise, taking hold about 3 ft from the end and lifting to a 45 deg angle. It is then carried to the next bench. Place the sheet gently on the bench.

Transferring and Marking

When transferring a pattern in order to obtain a number of identical pieces, the method to be used should produce a minimum of waste. It is sometimes more economical to cut across the sheet as noted in Fig. 1. At other times the best method may be to use the sheet the long way as in Fig. 2. There are many ways to hold down a pattern. The simplest is to use the heads of a double seaming stake or the round shafting ends which are to be found in any shop. The pattern and the blank can also be fastened together with C clamps.

Marking Blanks

Two methods are followed for marking blanks from patterns. One is the outlining of a pattern with a center punch. The other method is to follow the outline of the pattern with a scriber (Fig. 3). In this case it is important to hold the scriber at an angle away from the pattern to insure securing the correct outline.

Square or rectangular patterns are sometimes required and the blanks which have been previously cut may be

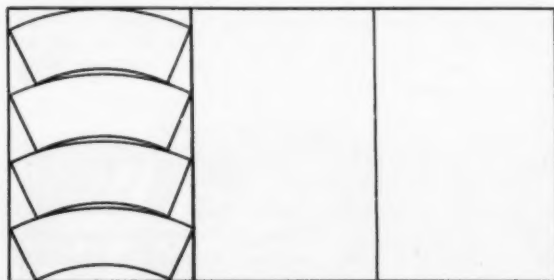


Fig. 1

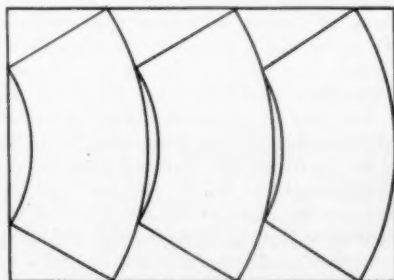


Fig. 2

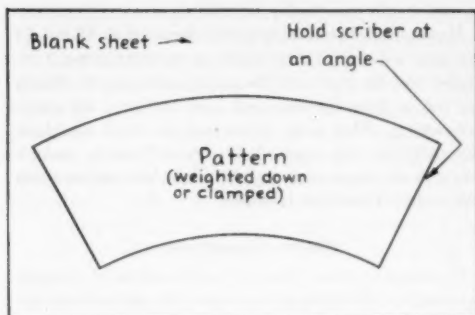


Fig. 3

held in position by small nails driven into the bench on 3 sides. The pieces are slipped into position one at a time and marked.

Sheet metal patterns are superior to paper or cardboard, as the latter wear away too quickly. If wooden templates must be used, place a short piece of metal at the edge of the board and press against this. In this manner the template will not wear away.

Marking Bends and Holes

After a pattern has been transferred and the proper holes are indicated, the next step is to mark the holes to be punched or drilled by placing a ring around each and marking the size hole required. See Fig. 5. Some men differentiate between bend and dot holes by placing a square around the hole dots and a circle around the bend dots. Others place a plus sign on the bend lines. Fig. 4. Where holes of different diameters are required in the same sheet it is necessary to indicate the correct size for each hole.

There are several ways of marking the direction and degree of the bends to be made when braking a sheet. In Fig. 5 are shown two methods of marking bends, one designated by the words up and down, and the other by

XX. The symbol XX denotes a bend and its position indicates whether the bend is an inside or outside one. The line adjacent to XX gives the angle to which the sheet is to be bent. Thus, the upper bend having the XX at the inside of the angle indicates an inside or up bend and the angle formed by the two lines is 45 deg. The lower mark at the outside of the angle denotes an outside or down bend and the angle of the lines is 60

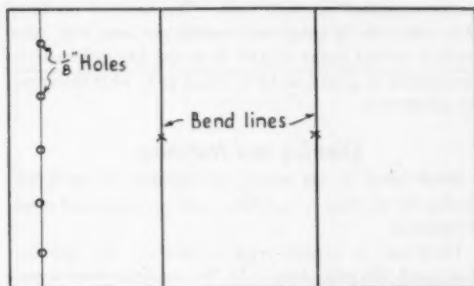


Fig. 4

deg. It will be noted that with the inside of the sheet uppermost, the 45 deg bend on each piece will be an inside bend and each 60 deg bend an outside one.

These patterns will be referred to later when the Pittsburgh seam is considered. While these instructions have been written for marking galvanized steel, the same rules apply for aluminum, black iron, etc.

Marking With Various Materials

There are several materials used for marking, the most common for galvanized steel is black crayon, preferably wax. Red is also used.

A mixture known as tinner's ink is sometimes used. This is made from raw or muriatic acid and copper oxide. Mix in small quantities and use with a wood skewer or stick. For black iron the use of soapstone or white chalk is recommended.

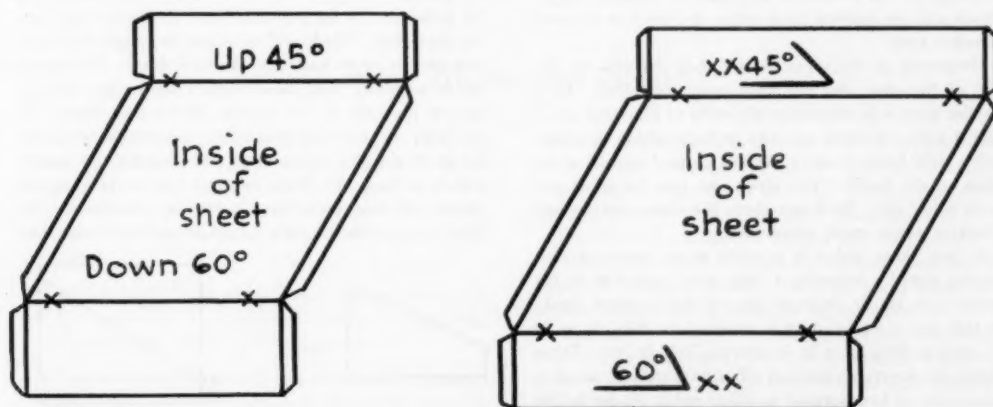


Fig. 5

A good method to bring out the lines on a pattern marked on black or cold rolled steel sheets is to rub a flat piece of soapstone across the scribe lines lightly. This will fill the scribed lines with soapstone and bring them out in bold relief. This is especially recommended for shearing off a small edge when it is necessary to sight down on a shear between the upper blade and the hold down attachment.

The cutting of odd shaped patterns from full sheets leaves a number of small ends. The habit of marking each end with its gauge will enable the next man who needs a certain gauge to pick it up quickly and make it unnecessary to gauge, or be in doubt as to what thickness the pieces are.

Shearing and Notching

Sheet metal is cut either by machine or by hand. Cutting by machine is quicker, more accurate, and more economical.

There are two general types of shears — the squaring shear and the gap shear. In the modern sheet metal shop a shear of 8 or 10 ft length is virtually essential because of the volume of work that must be sheared. The longer shears are more practical than the small sizes, because the large shear can do anything the small one can plus things it cannot do. Driving power for the shear may be furnished by an electric motor or a foot lever. All power shears have automatic hold downs. Foot shears are made with two types of hold downs, automatic and hand operated.

Gap Shear

The gap shear gets its name from the fact that it has a gap or opening in the housing on each side of the machine. This opening makes it possible to slit long sheets in the gap shear by moving them lengthwise through the shear. This operation is not possible in the squaring shear.

Both types of shears are equipped with front and rear gauges which may be adjusted quickly whenever it is necessary to cut a number of pieces to a given length. Sheets may be inserted from either the front or the rear of either type.

Placement of the shear in the shop depends on the size of the shop and the floor space available. In a smaller shop it is sometimes advisable to place the shear near a wall. A bench can then be built behind the shear and a slide fitted to carry sheared strips from the shear down to the bench. The strips can then be taken out from either end. In larger shops the shears are located wherever seems most convenient.

A long shear makes it possible to cut sheets to convenient sizes by trimming a little from each side so the layout man knows the exact size of the trimmed blank. In this way a 24 in. sheet is trimmed to 23½ in., a 30 in. sheet to 29½ in., a 36 in. sheet to 35½ in., etc. These sheets are sometimes squared off at both ends by use of a long angle or bar fastened to either end at 90 deg to the cutting edge. This angle or bar is often marked in inches

so any length can readily be cut.

Many shops do not have a shear larger than 48 in. In this case a bench can be placed at the rear about 1 in. higher than the bed, with the rear gauge removed. Sheets are fed in from the rear and held against a set gauge for cutting. This is the better way for short machines, especially the foot type. It is very difficult to make a cut with the sheet covering the entire bed and also the full width of the foot treadle.

Shear Operation

Operating a power shear is just a matter of pressing the treadle and releasing it at once, the motor doing the work. To operate a foot squaring shear it is only necessary to put the foot on the treadle and push down. Should the material need more pressure, hold on to one or both of the extension arms, stand on the treadle, and let your weight bring the treadle down to the floor completing the cut.

Caution: Never take both feet off the treadle and allow it to snap up. This may injure the operator and may damage the machine.

More Pressure

Sometimes greater pressure is needed. This is developed by the operator standing with his full weight on the treadle and providing further power by pressing down like a man does to get a start on a springboard. Another way is to grasp the two arms as above and pull up.

The position taken at a squaring shear is a matter of convenience; some men stand at the right, some at the left, and others in the center.

There are several things to remember when using a squaring shear: 1) Keep all moving parts well oiled, especially the blades or knives. 2) Keep hands and fingers away from the cutting edges and hold down. 3) Always have the wider part of the sheet at the front. 4) Always trim off a narrow strip to get a straight edge. This applies whether the front or rear gauge is used. 5) When necessary to cut off a narrow strip, never put the wide part to the rear and have the narrow part on the shear bed. Mark with a scriber and sight the mark between the upper knife and the hold down. Or make a cut on each end, bend down slightly and engage the cuts against the rear of the bottom blade; then shear off. 6) Never try to cut by suspending your weight with both hands on the two gauge arms and slapping the treadle with your feet. 7) When two men are working on the shears, see that both keep in step or coordinate. 8) Never use a squaring shear to cut any metal heavier than

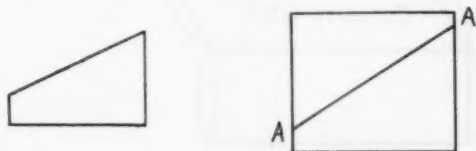


Fig. 6

specified by the manufacturer. 9) Never try to cut two sheets at once, across a riveted or grooved seam, or across a welded seam. 10) Never cut wire, rods, or flat stock on a squaring shear.

Straight shearing is just a matter of setting either the front, rear, or sometimes both gauges, trimming off a narrow strip to secure a straight edge, engaging the sheet against one of the gauges, and bringing the treadle down far enough to make a cut.

Sometimes there are pieces of metal to cut which are irregular in shape as shown in Fig. 6. There are three ways in which they may be cut.

1) By using the back gauge only, provided the two ends can be moved independently of one another, and feeding from the front. 2) By using the front gauge only, having it set to the proper angle and feeding the sheet from the rear. 3) By ascertaining the amount of metal needed to make two pieces, laid as in Fig. 6, setting either front or back gauge, cutting the rectangular pieces and then making cut A.

If the shop is equipped with a gap shear and there are certain sides or cheeks of ogee or S fittings to be cut as in Fig. 7A, fit two of the pieces together in such a way as to produce a minimum of scrap, as in Fig. 7B. Make the straight cuts up to point x at the end of the shear, and cut the rest with a hand or throatless shears. When making a number of these fittings in 16 or 14 gauge steel or aluminum, the saving in material and labor is considerable. Careful planning in fitting pieces together as in this example will result in reduced scrap and the savings mentioned.

There are many jigs or attachments which can be used to advantage on a squaring shear. The following is one which can be employed in cutting circles, especially with a power shear.

Take a piece of flat steel and bend an offset in it about 6 in. from the end and drill a hole in the end for fastening to one of the front arms of the shear with a nut and bolt. Weld or rivet a pointed piece of rod at the other end, place this point in the center punch hole of the

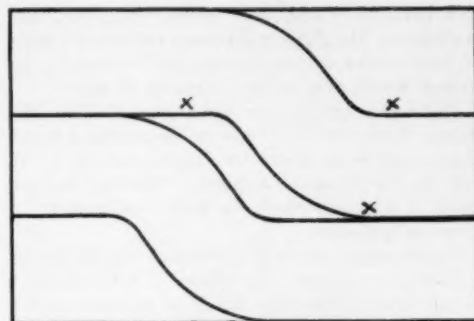
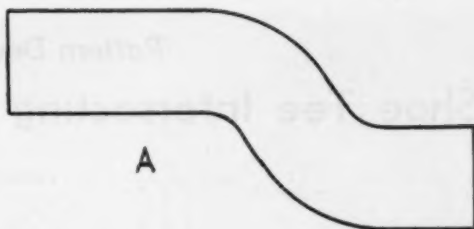


Fig. 7

circle to be cut, set at radius distance from the cutting edge, bolt fast, and hold the foot treadle down for a

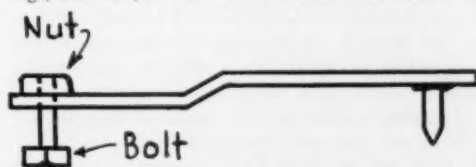


Fig. 8

continuous or repeat motion and turn the metal to be cut to the left, a little at a time. Side view, Fig. 8.

New Aluminum Plant

RICHARD S. REYNOLDS, JR., president of Reynolds Metals Co., Richmond, Va., recently announced that his company will build an \$80 million aluminum reduction plant in the Corpus Christi area. The plant will have the capacity to produce 150 million pounds of aluminum pig annually.

Work on construction of the plant will be started soon and it is expected to be in operation before the end of the year. About 600 people will be employed.

An electric power plant will be constructed in conjunction with the aluminum operation which will have the capacity to generate 175,000 kilowatts of power, all of

which will be required in the operation of the plant. The power will be generated by internal combustion engines which will use natural gas as a fuel. It requires 10 kilowatts of power to make 1 pound of aluminum.

The aluminum reduction facility will be housed in 4 buildings each 1,600 ft long. In addition there will be several buildings including a carbon plant which will produce the carbon required for the operation.

Aluminum is made from alumina which is made from bauxite. Approximately 400 tons of alumina will be the daily requirement for the plant. Other raw materials essential include 80 tons of petroleum coke, 5 tons of cryolite, and 20 tons of pitch a day.

Pattern Development For Shoe Tee Intersecting Round Pipe On Center

HUGH B. REID

THERE are three methods used in the layout of this fitting, all of which should be understood by the sheet metal layout man. Each method has its particular application. The AMERICAN ARTISAN will devote a series of three articles covering the simplified solution for the pattern development of the following fittings.

This article presents the simplified method for the pattern development of a shoe tee intersecting a round pipe on center as shown by drawing marked 1. It will be noted from the instructional drawing that the layout is superimposed on the front view drawing by means of projection.

The drawing is shown by broken lines and the layout is shown by solid lines. The triangle E, F, G is parallel to the vertical plane, thus it will be the same on the layout as on the drawing. All the developed lines will be at right angles to the corresponding line on the front view drawing. The spacing around the circumference of the shoe will correspond to the spacing around the half circle as indicated by the numbers 1 to 7 inclusive. (This spacing will be used as shown on the layout.) A thorough understanding of this method will provide the layout man with a time saving solution for this type of pattern development.

Following is a step by step solution of the problem.

Make the front view drawing as follows:

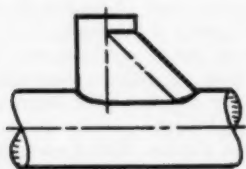
- Draw the line marked CL representing the center line of the large pipe. From this line measure the pipe radius which is equal to distance $P-R$ and draw the line $Y-Z$, marked pipe line.
- Draw the line $E-H$ and on the intersection of line $E-H$ & $Y-Z$, establish the point J . With H as center draw a quarter circle the radius of which is equal to the large pipe and indicated by the letters PR .
- With point J as center and the radius of the shoe tee as indicated by the letters SR draw a quarter circle. Divide the quarter circle into 3 equal spaces

and through the points project lines to intersect the large radius PR as shown by letters J, K, L, M .

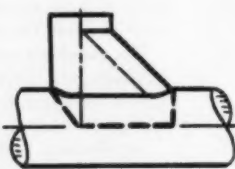
- With point E as center and shoe radius SR , draw a half circle, divide the half circle into six (6) equal spaces and number the points 1 to 7 as shown.
- From points 1, 2, 3, 4 draw vertical lines as shown by the broken lines. From points 4, 5, 6, 7 draw lines parallel to line $4-E$ as shown by lines $4E, 5N, 6P$. From points $E, N, P, 7$ draw lines at 45 deg to line $4-H$, as shown by the broken lines.
- Through the points J, K, L, M on radius PR draw parallel lines intersecting the broken lines at points T, S, R, F and G, U, V, W .

To develop the half pattern proceed as follows:

- The 45 deg triangle marked E, F, G is parallel to the vertical plane of projection indicating that it remains the same on the layout as on the front view drawing.
- From points N and U draw lines perpendicular to line $N-U$. Set a compass at distance 4, 5 on half circle and from point E as center draw an arc cutting the perpendicular line from N at $5'$. From point $5'$ draw a line parallel to line N, U and intersecting perpendicular line from point U at U' .
- From points P and V draw lines perpendicular to line $P-V$, set a compass at distance 5, 6 on half circle and from point $5'$ as center draw an arc cutting the perpendicular line from P at $6'$. From point $6'$ draw a line parallel to line $P-V$ and intersecting the perpendicular line from point V at V' .
- From points 7 and W draw lines perpendicular to line $7-W$. Set a compass at distance 6, 7 on half circle and from point $6'$ as center draw an arc cutting the perpendicular line from point 7 at $7'$ from point $7'$ draw a line parallel to line $7-W$ and intersecting the perpendicular line from point W at W' .



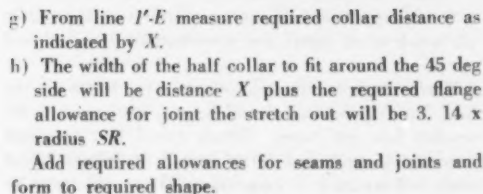
① SHOE TEE INTERSECTING
A ROUND PIPE ON CENTER



② SHOE TEE INTERSECTING A
ROUND PIPE OFF CENTER



③ HEAVY PLATE SHOE TEE
INTERSECTING ROUND
PIPE ON CENTER



Time-Saving Tips For The Sheet Metal Shop To Increase Efficiency And Profit

LAWRENCE GICHNER
Washington, D.C.

HERE are ideas that will mean money to you and make your company become a more effective competitor. Here are the answers to questions you have often wondered about.

The author just returned from a trip about the country where he visited many firms and enjoyed the happy pastime of shop talk. Wandering through sheet metal plants, large and small, engaged in both general sheet metal and those specializing in ductwork, he jotted down notes of gadgets and arrangements that impressed him. Whenever a shop had a feature that was different from others he had seen he noted it down.

Somewhere in the outline of items there are ideas you can readily apply. These time saving features will mean money saving to you.

He found there is no one set answer to most problems, but rather a variety of answers. Each contractor must select the solution that best suits his own individual situation.

No one can tell you what is best for your organization, but it helps to know the different solutions that others have chosen. You are then in a better position to select that answer which best suits your needs.

Work Benches

What is the ideal work bench? How is it made?

On this question there are many answers varying from all wood to all metal and combinations of wood and metal.

There are those who believe spruce top tables are the best, but that the legs should be of angle iron because wooden legs get loose. Others found that tempered masonite is unexcelled for a smooth top where layout work and accuracy is paramount. Tempered masonite



The sign painted on the shear reminds the mechanic that it is easier to find a small scrap of the right gauge if the gauge has been marked on it.

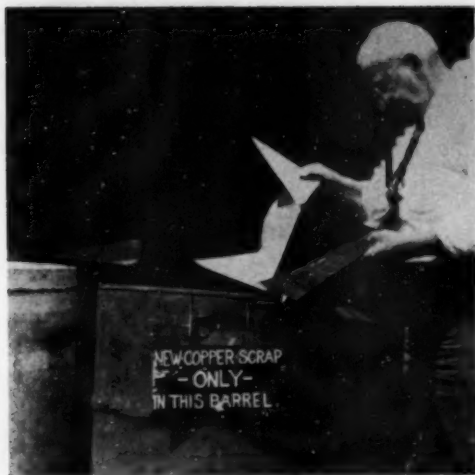
can take a lot of beating without showing much wear. For those who form aluminum, particularly for store fronts where scratches are an abomination, tempered masonite seems to be the answer in reducing blemishes to a minimum.

Galvanized Tops

In one shop that specializes in duct and ventilating work, they had their cutting table covered with a thin sheet of galvanized steel over a wooden base. Although it was well-covered with layout marks the proprietor felt it held up excellently well for this purpose and added years to the life of his table.

Quick Changes

One shop for the past ten years has been using wooden tops mounted on horses. A stock of tops and horses are kept on hand and they are quickly set up or taken down to make more space available as the demand requires. This arrangement has proved most satisfactory. Another organization doing a considerable amount of residential work, employing two dozen mechanics on fabrication alone, has all tables on rollers. They are



Scrap barrels marked for different materials save time in sorting. Sale of the scrap is speeded.



Here is a sturdily constructed shop bench. It was planned with large storage space underneath.

easily pushed about and quickly allow any set up that best suits their purpose.

Sheets Pre-trimmed

To trim or not trim that is the question. To buy sheets trimmed at the mill to desired sizes seems an important pre-requisite to many a shop supervisor whose organization specialized in ductwork. Yet I found just as many who felt it an unnecessary expense. Those who were in favor claimed "we can't at our wages pre-trim steel for 25 cents a hundred pounds which the mill charges. We

buy all our sheets pre-trimmed and in these sizes: 28 by 96 in., 29½ by 96, 35½ by 96, 47½ by 96, 48 by 96
Sheet Sizes

In ventilating shops is the sheet 120 in. long more advantageous than 96 in. Here again there is a division of opinion. Some men claim 10 ft sheets are too expensive to handle."

In an organization making 12,000 to 30,000 lb of duct a week the owner told me "We have found that our larger ducts of 22-20-18 gauge cut to best advantage from 48 by 120 in. sheets while our smaller lighter ducts of 26 gauge we make from 36 by 120 in. sheets.

Check Pittsburgh Machine

With what speed does the machine that makes your Pittsburgh edge run? It may be a smart idea to check yours. Seconds wasted can amount to a lot of money in a year. If it requires more than 25 to 30 seconds for an 8 ft piece to completely pass through, the machine is running slower than the average.

Drive Cleats & S Bars

To stock cleats or not to stock cleats is the question practically everyone in the duct business has asked himself. Many still make up the cleats as they need them for each particular job.

Others find it to their liking to have a quantity already made up in advance which they stock in their most frequently used sizes.

One large organization with 20 mechanics in the shop just making up ducts, 90 per cent for residential jobs, stock a large quantity of cleats 36 in. long. Right by the bins where the cleats are stored they have a small shear set up where the cleats are readily cut to size and immediately weighed on a small scale close by.

How to Charge for Metal

The greatest percentage of shops charge their metal after it is fabricated by weighing it prior to leaving the shop.

The writer, himself engaged in the sheet metal business, has for years based his costs on the weight of the full sheets drawn from stock, and charged at the time it is taken. This he believes gives a more accurate cost figure rather than later allowing a certain percentage for waste. This method also accounts for any spoilage which the weighing after fabrication does not take into consideration. Again no two shops seem to agree on the same percentage of waste for a job. Asked what they allow for waste for a job, the writer has received answers varying from 3 all the way to 20 per cent. There are different conditions in which any one of these answers could be correct.

Whether anyone has actually made a scientific study of waste percentages is a serious question in the writer's mind.

Which method do you use? We would certainly like to learn your answer. If it is percentage, what is your

percentage and how did you arrive at this conclusion. Your reply will be held in strict confidence (if you so advise) and in return we will give you the reply of others.

Storing Finished Items

One of the biggest assets a shop can have is sufficient space to store finished items for future use. "By having a warehouse to stock our parts" says the partner of a shop doing a large percentage of ductwork "we can take care of the rush in spring, and during the slow months of February and March we provide steady employment for our mechanics."

Some organizations store material prior to use in adjacent space, others have large lofts immediately above the shops where access doors, elbows, fittings, and nested duct are hoisted. Some stack it in an open yard feeling that it will be little damaged by the elements the short time it remains. Some keep it partly protected under a lean-to or with tarpaulins.

Ample storage permits a steady flow of work.

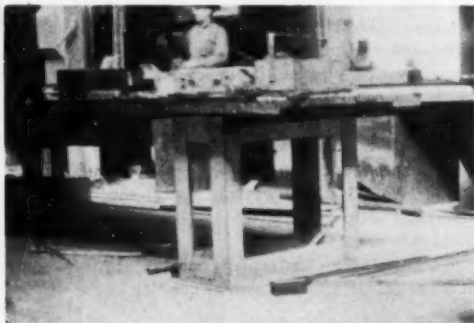
Special Machinery Others Could Use

There are sheet metal contractors who have ingeniously made tools for their own use and if they were so disposed they could readily fabricate and sell them to the industry. When I've asked why they don't sell to others, I invariably get the answer that they are content to use the innovations themselves and are in the sheet metal not machinery manufacturing business.

A particular contractor we have in mind on the East coast has built with gears, motor and heavy I beams a machine for grooving large pipe and ducts that finishes in seconds what would require much, much more time by malleting. He has also made a table for riveting angle iron to duct which enables one mechanic to do the work of two.

Radio Plays Continuously

A 28 year old heating firm that does its own ductwork had some 2,900 houses under contract at the time of our visit. To give you some basis of judgment of its size they buy 5,000 grilles a month. As we walked through the shop a radio was playing. Being the first time we had seen or heard this instrument in a sheet metal plant



Horses like this made of galvanized scrap are useful for quick setup of jobs.



A small shelf hung on the brake will save time in hunting for hand tools.



Collapsible horses are stored in the yard.

playing during working hours we asked the mechanics if they found it annoying particularly when they wanted to concentrate on some particular problem. Quite to the contrary of what I anticipated the general replies were "We like it," "We are used to it," "It keeps us happy," "We'd miss it if it wasn't on."

Cost of Shop Drawings

Some ventilating shops make up a very thorough set of drawings of every duct line submitting size, gauge and detail for the consulting engineer's approval. Others do not know what it is to employ a draftsman and supply work from the original blue prints supplemented with measurements made on the job.

If you would be interested in what shop drawings cost here are the figures to compute percentage expense.

A duct shop that occupies some 14,000 ft of floor space and uses from 12,000 to 30,000 lb of galvanized steel sheets a week kept a very accurate record and found that the drawings on a \$135,000 job cost \$7,000.

Equipment Lost

Lost tools amount to a sizable item in many organizations every year. Hand drills have a remarkable ca-

capacity for vanishing. One contractor carefully checked and learned that on a \$50,000 job he was destined to lose two A ladders, two $\frac{1}{4}$ in. drills, and a set of squeeze tongs.

To save time and avoid losses a Philadelphia contractor has the man who lays out the job make a list of everything that will be needed in terms of:

- Ladders
- Ropes
- Bolts
- Electric cords
- Special tools
- Scaffolding
- Hangers (not cut on job but shop)
- Damper quadrants

When the job is completed this list is again checked to see what should be returned.

An excellent idea would be to keep a carbon copy with the foreman on the job signing for what he receives during the construction of the work and given credit when it is returned.

Aluminum Roof Trouble

Be cautious if you have an aluminum roof job on a structure that has excessive movement or vibration.

A sheet metal contractor with more than 40 years experience in the trade relates how over 4,000 sq ft of aluminum roofing under a strong wind curled up like a blanket of snow and rolled to the ground in spite of the fact that it was fastened with $\frac{1}{8}$ by $\frac{7}{8}$ in. aluminum fingers.

The roof was installed over a coal breaker which shakes two carloads of coal at a time. The vigorous shaking simply was too much for the strength of the $\frac{1}{8}$ in. aluminum.

Today the roof has been replaced with 3/16 by $\frac{3}{4}$ in. strips wrapped around 12 in. eye beams and fastened with two aluminum bolts.

Make Drive Cleats in Quantity

Some organizations make their drive cleats as required for each job. Others let their scrap accumulate by the shears and then once a week, once a month or when stock is low, will cut up a large quantity and run them through the forming rolls all at one time.

Scrap Problem

What to do with scrap seems to be a universal problem in all shops yet with the present day material scarcity there are more potential outlets to sell it than usual.

Pieces 16 to 20 gauge galvanized in size of 3 by 12 in. can be sold to small parts manufacturers.

Normally worthless scrap is today bought by practically every junk dealer.

One contractor to keep waste material from scattering all over his floor, as it will do, has built a 12 in. high metal partition 6 ft wide behind his shears to keep the material together.

A Cleveland dealer has cut a hole through the outside wall of his building, right by the shears and throws his scrap on to a vacant lot next door.

Handling is what makes the scrap problem expensive. In our own shop we have aluminum painted barrels at the end of every bench and also strategically placed throughout the plant. Dealers rightfully object to paper and trash being mixed with metal scrap. To avoid having the mechanics discard their lunch bags and debris in with the scrap, extra barrels are set up for trash.

On Saturday morning the metal scrap barrels are all wheeled on to a truck and taken to the junk dealer.

Subcontracting In The Sheet Metal Shop

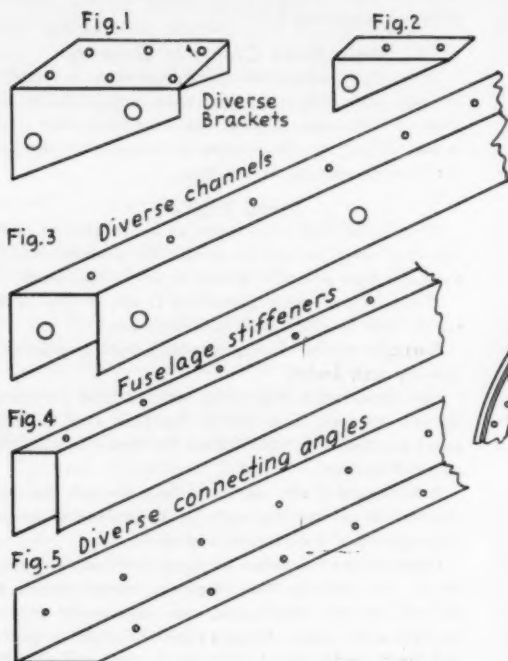
Some Typical Products

ERNEST E. ZIDECK

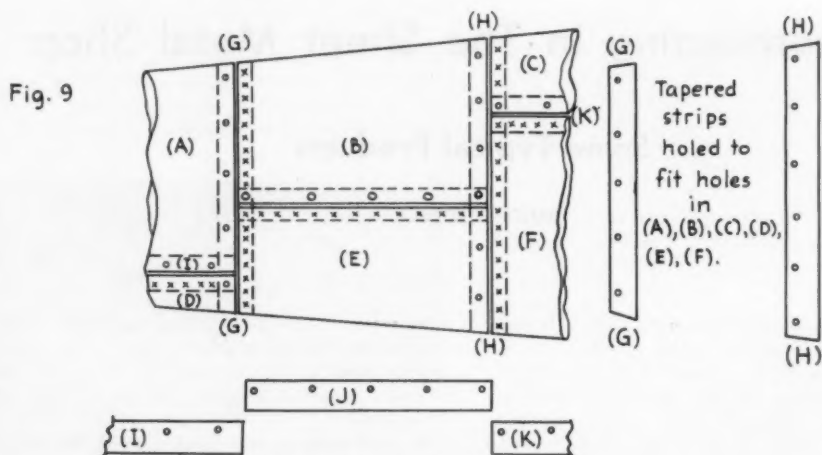
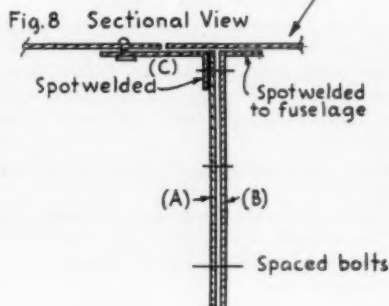
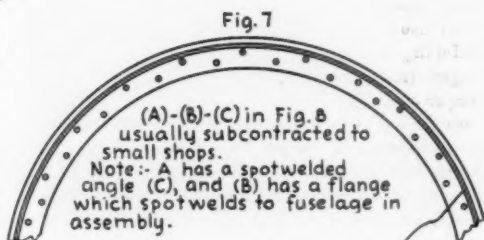
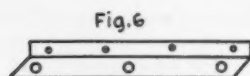
PRODUCTION of small sheet metal parts is farmed out to small shops for various reasons. One is that these parts are almost exclusively hand made, which means their production requires more sheet metal experience and mechanical ability than can be expected from inexperienced help in war plants. Technical and supervisory personnel in factories holding prime contracts are too busy with other work to devote time and attention to overseeing production of these parts. An-

other reason is that planes, ships, and other transport facilities are required in great numbers in the shortest possible time. Prime contractors can deliver the products more quickly if component parts are received ready for assembly.

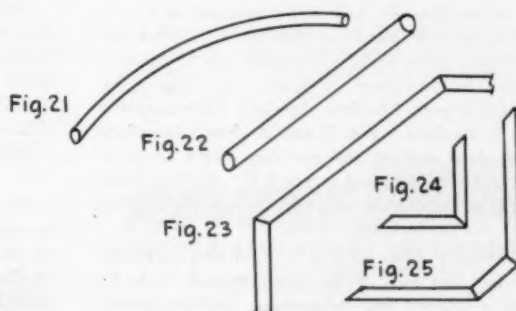
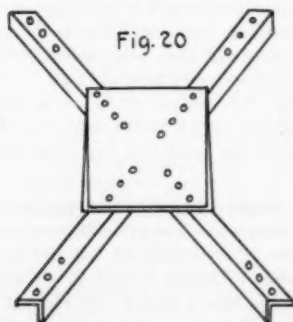
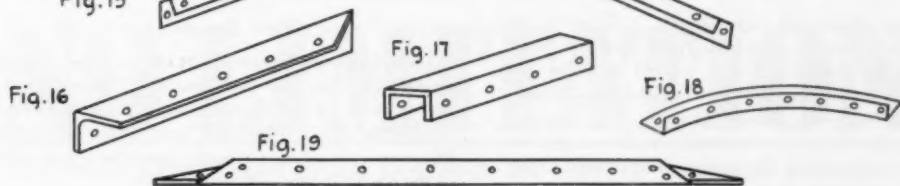
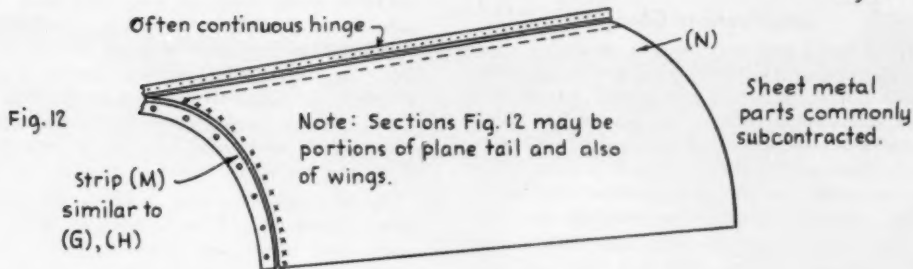
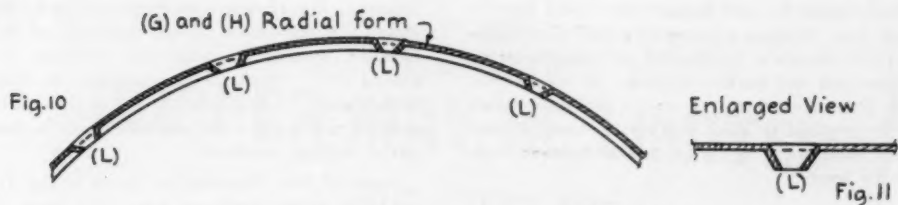
By hand made is understood shearing, bandsawing, forming, drilling, and fitting of sheet metal parts. Dies cannot be used in this production because die shops are busy with more intricate work and it would take



Fabrication of Parts Farmed out to small shops.



Strips to fit taper and holes in (A), (B), (C), (D), (E), (F).



too long to deliver dies, even where feasible. Special machines cannot be used because they would have to be built first. Whether a factory or a small shop makes these parts, both do so by identical processes employing the same tools and working methods. It will be seen in the illustrations that very few of the parts shown could be produced by dies. And even if stamping were possible there would be a great deal of finishing work to do by hand.

Specifications Change

The armed forces are constantly modifying planes and other equipment. Many parts and sub-assemblies remain current for an indefinite period. On the other hand, specifications could be changed on short notice. Under these circumstances no time-consuming die sinking or building of special machines is possible. Parts for war production are needed without delay as the order is placed, in quantity for immediate use.

Thus, in subcontracting for parts made of sheet metal, plate, extrusions, or tubing (all sheet metal work) the most important thing is to procure the parts, made exactly to specifications, in the shortest possible time. A subcontractor in this category must plan his own auxiliary tools and equipment and construct them himself. But as he will seldom be given more than one item to produce at a time, he can concentrate and secure the tools for that item alone. Auxiliary tools in this type of production consist mainly of jigs and fixtures. In almost every case these can be made in the sheet metal shop. They can be welded plate, angles, or machined steel. Hardened drill bushings can be inserted where required.

Model Used

In the production of parts like Fig. 1, 2, and 6, the simplest procedure is to make a pilot model or piece. When the first sample has been finished it can be used as a guide for making drill jigs or production fixtures as well as inspection gauges. Usually it is necessary to keep within fairly close tolerances in the manufacture of parts of this type. The proper gauges make it easy to keep production up to standards.

The strips, channels, and angles indicated in Fig. 3, 4, and 5, are thin aluminum and can be formed and punched in a press brake. Templates can be made to determine the placement of holes. Drill jigs speed production of parts like these especially where a curved surface is involved. Fig. 7 and 8 show connections between plane sections and one shop might be given strip B to make, and another A and C. As these strips are radial and tapered, accurate drill jigs are an absolute necessity for producing the parts.

The assembly shown in Fig. 9 could be complicated by the fact that each of the panels marked might be given to a different shop to produce. Accuracy would obviously be necessary if the panels were to fit together in final assembly. Fig. 10 shows dimples in panels and

strips, for fastening by self-locking screws or speed fasteners. Fig. 11 shows the dimple enlarged. Fig. 12 shows a plane section in the underside of the tail assembly, opening on hinges for operation of rear landing gear. Similar construction may be found in aircraft wings. Individual shops will be given particular parts to make, with aluminum welding to be done on special welding machines.

Braces of sheet aluminum are shown in Fig. 13, and are to be riveted inside the wings of a plane. Since each brace is of a different size and shape, the individual shop is seldom given more than one to work on at a time. Fig. 14 to 19 are extrusions bandsawed to size and shape and drilled for bolts and rivets. Here again accuracy is of prime importance for the final assembly of the aircraft wing cannot make use of segments that do not conform to specifications.

Fig. 20 is self-explanatory. It will be required complete as shown. Fig. 21 to 25 relate to tubing cut to exact shape, curved, and welded together. Welding fixtures are necessary, but they are easily made in the subcontractor's own shop.

Typical Parts

The drawings of parts that accompany this article are indicative of the nature of the parts that may be made by a subcontractor. They also give an idea of the type of jigs and production accessories that may be needed. In the production of implements for war there are hundreds of individual parts, all slightly different, that may be required. Actually, no single part is very difficult to make, provided the proper tools and equipment are planned and utilized.

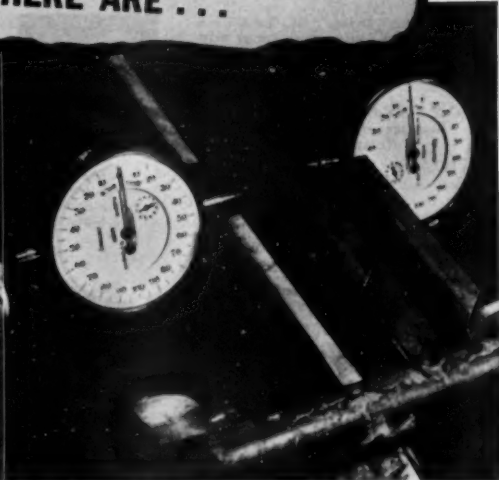
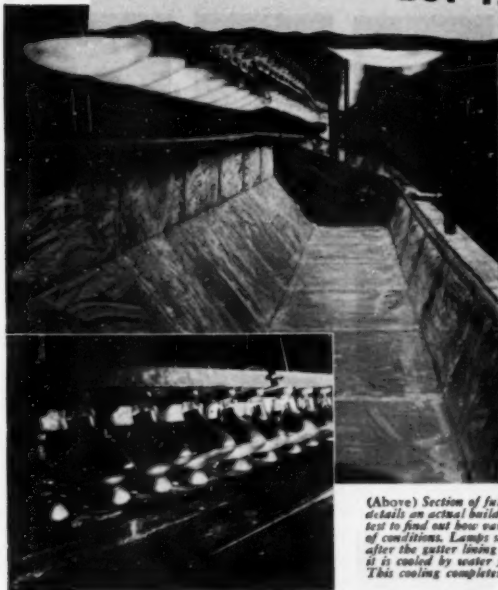
Steel Expansion

STEEL COMPANY EXPANSION PLANS have been greatly accelerated in the past three months. The total annual steel capacity of the United States will be boosted to 117,500,000 tons, a record high level, by the end of 1952. This total is based on a recently completed survey made by the American Iron and Steel Institute.

The total increase will be the largest ever accomplished in a short term period anywhere in the world. Over 18 million tons will have been added to total annual capacity in three years from the start of 1950 to the end of 1952. An increase of nearly 5 million tons was achieved last year, with the result that the annual steel capacity of the country is now more than 104 million tons.

The scheduled growth to the level of 117,500,000 tons in two more years is over 7 million tons larger than predicted in an announcement last October by Secretary of Commerce Charles Sawyer on the basis of the best information then available. By the end of 1952, steel capacity will have grown nearly 36 million tons from 1940, an increase of 45 per cent.

THE USES OF COPPER MAY BE LIMITED BUT THERE ARE ...



(Above) Section of full-scale model gutter simulating in all essential details an actual building installation is put through every conceivable test to find out how various gauges of copper will act under a given set of conditions. Lamps simulate the sun, while photo at left shows how, after the gutter lining has been brought up to maximum temperature, it is cooled by water flowing over the surface, simulating a shower. This cooling completes a cycle in the accelerated tests.

(Above) Dial gauges record expansion and contraction at gutter expansion joints during accelerated tests. Transfer of accumulated movement was found more efficient in thicker, cold rolled copper than in thinner soft copper.

NO LIMITATIONS

on Revere Copper and Brass Research and Revere Technical Advisory Service

• Restrictions, or no restrictions, Revere Research will be doing business as usual... testing, perfecting and improving products and techniques, working to make even better, more efficient products for the future.

Actually, the limitations on copper for civilian uses and the filling of D.O. rated orders will probably result in more work for Revere Research Laboratories and Revere Technical Advisory Service.

For users of Revere Products will be wanting to know how they can stretch their allotment of materials in order to get the most out of them. Revere will welcome such inquiries; be only too glad to work with you on your problems; give you the benefit of its knowledge gained from a century and a half of working with metals.

For the newest in flashing installation techniques ask the Revere Distributor about Revere-Keystone Thru-

Wall Flashing*. He also will advise you of the availability of materials, and put you in touch with Revere's Technical Advisory Service in the event you wish to discuss your technical problems.

*Patented

REVERE 150TH YEAR OF
SERVICE TO AMERICA
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.; Sales Offices in Principal Cities, Distributors Everywhere

SEE "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

Schaefer BRUSHES

FOR PLUMBERS...FURNACE MEN...HEATING CONTRACTORS

Performance tested, SCHAEFER Brushes offer longer wear, better service, greater value—with the correct brush for every industrial and domestic use.

SCHAEFER Flue and Boiler Brushes of SILVER BRITE Rustproof Wire

SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.



SCHAEFER Rectangular Flue Brushes
No. 8-415—2"x1"x4 1/4"
No. 8-416—3"x5"x4 1/4"



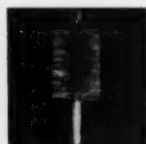
SCHAEFER Boiler Brushes
No. 8-393—1 1/2"x4"x5 1/4"
No. 8-394—2 1/2"x6"x6 1/4"
No. 8-395—3 1/2"x8"x6 1/4"



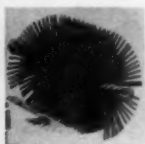
SCHAEFER Boiler Brushes
No. 8-399—1 1/2"x6"x4 1/4"
No. 8-391—2 1/2"x6"x4 1/4"
No. 8-392—3 1/2"x6"x4 1/4"



SCHAEFER Boiler Brushes
No. 8-399—2"x4"x6"
No. 8-400—2 1/2"x4"x6"
No. 8-401—3"x5"x6"



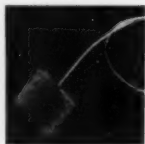
Single and Double Spiral Flue Brushes
No. 8-432—Single Spiral—1" to 4" dia.
No. 8-433—Double Spiral—1" to 4" dia.
No. 8-434—For small Flues, 1/2" to 1" dia.



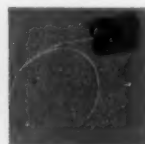
SCHAEFER Round Flue Brushes of Single Spiral Flat Steel Wire
No. 8-439—1" to 4" dia.



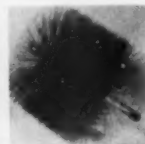
SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral
No. 8-420—2"x3 1/4"x4"
No. 8-425—2 1/2"x5 1/4"x4"



SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel
No. 8-442—3", 4", 4 1/4", 5" with 5 ft. handle.



SCHAEFER Fibre Furnace Brushes
Selected Basine fibre, flexible wire stem, 4", 5", 6" dia., 28" and 60" handle.
No. 8-444-445



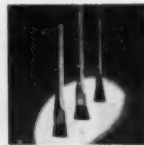
SCHAEFER Chimney Cleaning Brushes
No. 65—6", 7", 8", 10" and 12" dia., round style of Black Tempered Brush Wire.
No. 656—6", 7", 8", 10" and 12" dia., oblong style of Flat Tempered Steel Wire.



SCHAEFER Wire Wheel Brushes
Solid Center Type of crimped steel wire.
No. 276—6" dia. x 1 1/2" face.
No. 278—8" dia. x 1 1/2" face.
No. 280—10" dia. x 2" face.



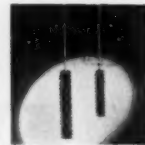
SCHAEFER Handy Wire Brush
No. 816—For roughing, soldering etc., 6" long, tempered steel wire trimmed 1 1/4".



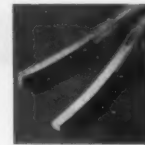
Tin Handle Acid or Dope Brushes
Selected grade bristles in tin ferrule. Width, 1/2", 3/4", 1".



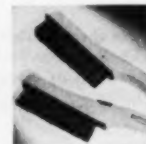
T. W. Flat Acid Brushes
Timers soldering brush, horsehair filling, 1 1/4" width, 7 1/4" overall. Twisted wire handle.



Radiator or Condenser Tube Brushes
Twisted in wire handle, selected hair or bristle. Wide range of size.
No. 10—3/8" dia. x 2" brush x 6 1/2" overall.
No. 11—1/2" dia. x 3" brush x 8 1/2" overall.



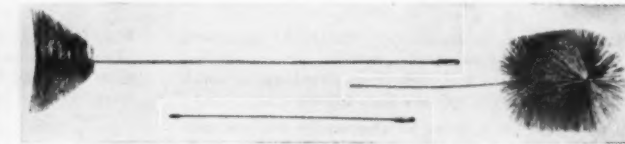
SCHAEFER Curved Handle Wire Brushes
No. 819—Oil tempered steel wire, trimmed 1 1/4", hardwood block, 14" long. Brush 6", 2, 3 or 4 rows.



SCHAEFER Shoe Handle Wire Brushes
No. 812—Oil tempered rustproof wire, 5" brush, 2, 3, 4 rows. Trim 1 1/4", overall 16".



SCHAEFER Straight Back Wire Brushes
No. 800-11—Oil tempered steel wire. Hardwood block, 7 1/4" x 2 1/4". Wire trim, 1 1/4", 6 x 19 rows.



SCHAEFER Vacuum Cleaner Brushes
No. 1005—Basine Fibre Brush, 10 1/4" dia. tapered to 3" dia. x 6 ft. long—48" handle with threaded nipple at end.
No. 1006—Basine Fibre Brush, 10 1/4" dia. brush x 19" long. Handle 39" with threaded nipple at end.

Wire Flue Brush and Extension Handles
4 ft. Handles with Nipple and Coupling.
5 ft. Handles with Nipple and Coupling.
6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

SCHAEFER BRUSH MFG. CO.
117 W. Walker Street Milwaukee 4, Wisconsin



ASSOCIATION ACTIVITIES



Arkansas

THE SHEET METAL CONTRACTORS Association of Arkansas met February 17 with the president of the Sheet Metal Contractors National Association to discuss the impact which metal demands of the defense effort will have on the industry.

W. A. Weidenmann, Kansas City, Mo., SMCNA president, called on the group to make a coordinated effort to stand up for their rights in seeking their share of the metals needed for civilian maintenance and repair work.

Canadian Chapter

THE FIVE-DAY WARM AIR HEATING SCHOOLS held by the Canadian Chapter, National Warm Air Heating and Air Conditioning Association, got away to a flying start again this year with 78 delegates in attendance at the Toronto session and 58 attending at Hamilton.

The Toronto school was held January 8-12 at the Canadian Legion Bldg., and the Hamilton school, January 17-19 at Knight Hall. Wilson R. Scott of H. S. Scott and Sons, an associate member of the Canadian Chapter, was chairman of the Hamilton operation.

F. W. Taylor, former engineer of the Canadian Chapter and T. A. Clark, the Chapter's new technical director,

were in charge of the Toronto school. Mr. Clark and A. G. Salmon, a member of the Technical Advisory Committee, did the lecture work at the Hamilton conference.

Schools are also being held at Windsor and London and the remaining schools of the 1951 educational program are as follows:

Ottawa — March 26-30

Montreal — April 9-13

Amherst — April 23-27

Quebec City — April 30-May 4

Los Angeles

THE REGULAR MEETING of the Institute of Gas Heating Industries was held on Thursday, January 11th, at 6:30 p.m. at the Nikabob Restaurant, 9th and Western, Los Angeles, with 66 members and guests present.

President Bridges presided and requested approval of the minutes as published.

Reggie Hesling reported on the engineering and sales training course in the form of a general statement. Advertising and publicity activities were reported by Sam Jaffe; and ordinance developments, by Glen Ashburn. The treasurer's report was read by the managing director

(Please turn to page 114)

COMING EVENTS

March 19-22—Forced Warm Air Conference, 20th Annual, Michigan State College, East Lansing, Mich. Chairman, Dean Lorin G. Miller. Fee, \$22.00

March 20-23—Forced Warm Air Conference, Annual. Iowa State College, Ames, Iowa. Engineering Extension Service, 110 Marston Hall. Fee—\$20.00

March 21-24—Warm Air Heating Short Course, Annual. Purdue University, Lafayette, Ind. Chairman, Merle M. McClure.

March 30-31—Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania. Annual Convention, Brunswick Hotel, Lancaster, Penn. Charles Luppold, Convention Chairman, Reading, Penn.

April 2-4—Sheet Metal Contractors Association of Illinois, Inc., Annual Convention. Jefferson Hotel, Peoria, Ill. W. R. Shaw, Secretary,

695 E. State St., Jacksonville, Ill.

April 2-6—National Oil Heat Exposition and Annual Convention, Navy Pier, Chicago, Ill. Oil-Heat Institute of America, 6 East 39th St., New York, N. Y.

April 6-8—1951 Eastern Refrigeration and Air Conditioning Exhibition, Hotel Statler, Buffalo, N. Y. Refrigeration Equipment Manufacturers Association, 1346 Connecticut Ave., N.W., Washington, D. C.

April 10-12—Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association, 40th Annual Convention. Pantlind Hotel, Grand Rapids, Mich. N. J. Biddle, Secretary, 3035 E. Grand Boulevard, Detroit, Mich.

April 30-May 2—Sheet Metal Contractors National Association, Annual Convention, Broadmoor Hotel, Colorado Springs, Colo. J. D. Wilder, Executive Secretary, 170 Division St., Elgin, Ill.



ASHVE Holds Largest Air Conditioning Show

Exhibits of heating, ventilating, and air conditioning equipment occupy all available space in Commercial Museum, Philadelphia. Warm air heating manufacturers feature year round air conditioning systems.

THREE HUNDRED FIFTY exhibits at the 10th International Heating, Ventilating, and Air Conditioning Exposition testified to the remarkable stature and confident outlook of an industry that is achieving new advancements. The exposition, largest of its kind ever held, occupied all space available in Commercial Museum. It was held at Philadelphia, January 22-26, under the auspices of the American Society of Heating and Ventilating Engineers and simultaneously with the society's 57th annual meeting. The exposition drew attendance from a wide area, with

visitors registered from all parts of the United States and many foreign countries, amounting to a total registration of nearly 18,000. Members of ASHVE were strongly in evidence during the week. An even larger group of visitors represented heating and ventilating contractors and dealers. Many of the latter were seeking to expand their lines to meet increasing demands introduced by changing trends in manufacturing processes which employ heating, cooling, and ventilating equipment, and also by advances in the construction industry which affect heat-

ing and ventilating applications in many ways.

It was the fourth annual meeting in Philadelphia, the Quaker city chapter having been host in 1921, 1930, and 1942.

Educational Displays

Noteworthy features of the exposition were the large exhibits showing complete units ready for installation, their excellence of design and attractive finish, and the educational value produced by the carefully planned displays. The exhibits were generally superior to those of previous heating and ventilating expositions.

An optimistic outlook on sales for the industry is sustained by the orderly growth of demand based on new industries, plant expansion required by established industries, and continued demand for housing. An underlying factor that many members of the industry are taking into their calculations seriously is the increasing acceptance of year round air conditioning in the residential market. On the other hand, there was no disposition among the exhibitors to discount the uncertainties of the business outlook. While some manufacturers appeared unconcerned over the prospect of securing sufficient raw material to care for their needs, others were frankly working on projects of modified designs using substitute materials.

The exhibits of heating apparatus constituted the most comprehensive display ever gathered under one roof. Equipment exhibited ranged from simple hand fired furnaces to year round units. Nearly every manufacturer showed gas burning equipment and exhibits of gas burners and gas controls were numerous.

Suspended Units Popular

Modern and ingenious describe the compact forced air furnaces designed for small houses. Among these are cabinet, floor, and attic types, and the thin vertical furnaces designed to fit in walls of standard frame construction. The popularity of suspended furnaces has caused this type of unit to multiply to the point where it is available from most manufacturers.

One exhibitor has developed this model into a flexible unit that can be converted for installation on the floor simply by standing it on end turning the burner, controls, and inspection plate through 90 degrees.

Special Purpose Fans

Fans and blowers particularly adapted to the needs of manufacturing plants, warehouses, and public buildings, and ranging down into styles and sizes for application in homes, were amply represented.

Air filtering apparatus, from the numerous types designed for domestic heating units to several examples of large units intended for industrial applications and installation in large buildings indicate the increasing importance of clean air. One manu-

facturer who recently developed a package summer cooling unit for installation as an accessory on domestic winter air conditioning units has incorporated in it a compact electrostatic filter.

Another exhibitor showed an automatic lint filter for textile mills, in which a single ply sheet of specially fabricated paper rolls across a screen and is caused to inch along slowly as air resistance builds up, thus renewing the surface continuously.

Cooling Units

One of the remarkable features of the exposition was the increase in number and variety of cooling units. These ranged from complete year round forced warm air heating units to packaged units for converting

existing systems. All units feature hermetically sealed compressors which require minimum service.

Outdoor Controls

The influence of outside temperatures on heating control was revealed in the variety of indoor-outdoor controls displayed. One manufacturer has developed an outside control that is sensitive to wind. Another has developed a circuit in which the burner cycle is automatically adjusted to match the weather, anticipating the needs inside by literally measuring the heat loss.

Other outside controls included a system that switches from oil to gas and back again according to predetermined settings and temperature changes.

Indiana Convention Hears Gripping Talks On Atomic Power And Communism

THE 33RD ANNUAL convention of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana turned out to be another outstanding event, as this meeting has been in the past. Held at the Severin Hotel, Indianapolis, meetings and social events occupied the two days of Feb. 1 and 2.

Actual opening of the convention came on Thursday afternoon, Feb. 1. Frank Stewart of Indianapolis, convention chairman, welcomed the group to the city and turned the meeting over to President Wm. Garber. The regular business meeting of the association was held along with the election of officers.

A report of the warm air heating short course at Purdue University was offered by T. B. Speaker, Lafayette. The success of last year's school was mentioned and plans for the 1951 course discussed. It will be held on March 21-24, at the Purdue campus, Lafayette.

Taxation

Clarence Jackson, Indianapolis, was the next speaker of the afternoon and his topic was Inequality in Taxation. Particular reference was made to the farm cooperatives which pay no taxes to the Federal government, but enjoy all the privileges of a tax-paying corporation. This is a field in which the Indiana association has been quite active and those in attendance expressed approval of Mr. Jackson's ideas.

There was general agreement that the next speaker on the program gave one of the most powerful speeches that

had ever been heard at an Indiana convention. Robert J. Kryter, Esterline-Angus Co., Indianapolis, talked about Atomic Power in Peace and War. He kept his listeners enthralled as he described the incredible force for good or evil that man has discovered with the accomplishment of nuclear fission. Speaking from brief notes, he told of the history of the atom bomb, the construction of the vast plants that are required to produce it, and the prospects for future peacetime use of atomic power.

The convention banquet was held on Thursday evening, with dancing following the meal. The orchestra was provided by the Fur-Mets, salesmen's auxiliary organization.

The Metal Picture

Friday morning, Feb. 2, the first speaker was J. D. Wilder, Elgin, Ill., executive secretary of the Sheet Metal Contractors National Association. Mr. Wilder described the material supply picture for the sheet metal contractor for the year of 1951. He told of the restrictions on material and its uses that have already been imposed and those which are likely to come. The need for organization of the sheet metal industry on the scale of the plumbing industry was pointed out. The way Washington operates now, any industry which can bring effective pressure to bear on government agencies can obtain the kind of treatment it needs to survive. The industry which cannot develop this pressure may soon be in hard straits.

R. M. Nelson, Armco Steel Corp., followed Mr. Wilder



Scenes at the banquet

in a speech of similar content. Speaking from the point of view of the steel producer he told the group what they could expect in available steel during the coming year.

Elmer Krueger, Indianapolis, gave a description of a recent trip around the world in which one of his principal objectives was to learn the attitude of the other na-

tions toward the United States. He stated that we must do a better job of selling capitalism to the world, if communism is to be overcome. People must be made to realize that the capitalistic system of free enterprise is responsible for the present position and power of this country.

Officers

President	L. D. O'Donnell, Vincennes
1st Vice president	H. Merle Daily, Hammond
2nd Vice president	A. Schnakenburg, Evansville
Treasurer	Homer Selch, Indianapolis
Secretary	Frank E. Anderson, Terre Haute

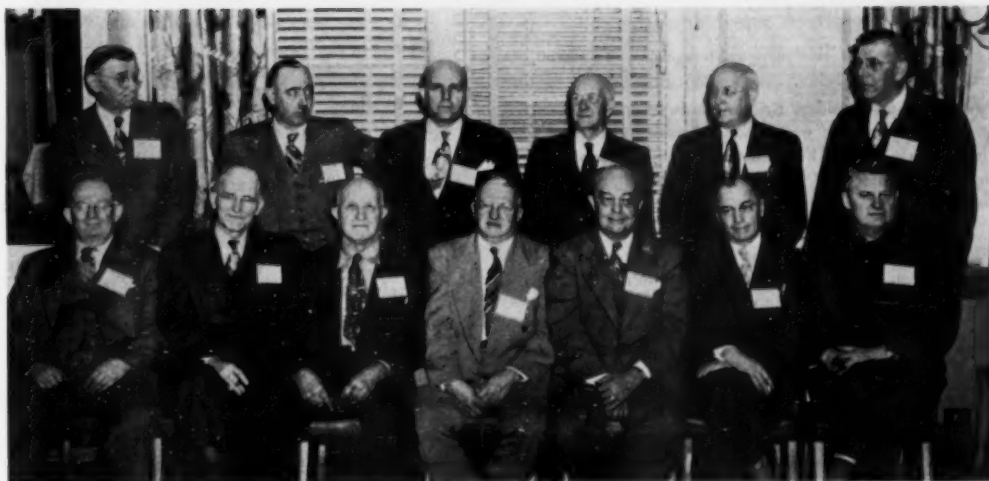
Directors

Preston Ake	Fort Wayne
E. L. Carr	Indianapolis
Philip L. Cordes	Seymour
Elmer P. Love	Indianapolis
H. W. Meggs	New Castle
Earl Troeger	South Bend
James R. Walker	South Bend
Wm. E. Garber, Jr.	Indianapolis
T. B. Speaker	Lafayette

The Red Menace

The first speaker of the afternoon session succeeded in rousing the meeting to fever pitch. H. J. Pierson, of the Indianapolis Chamber of Commerce, spoke on Communism and pulled no punches. He laid the facts right on the line and offered to back up every statement with positive proof. He told of objectives and techniques of the Communist party in this country and said that those objectives are closer to realization than the average citizen would believe.

Marshall Abrams, executive secretary, Construction League of Indiana, followed Mr. Pierson. Before he began his own talk he offered some of his experiences to back up the statements made by the previous speaker. Indiana legislation affecting the heating and sheet metal business was the subject discussed by Mr. Abrams. He



The Indiana Quarter Century Club — (Years in industry in parenthesis) Front row: N. T. Dick, Indianapolis (26); Frank Anderson, Terre Haute (40); A. R. Harris, Hammond (43); Homer Selch, Indianapolis (45); E. L. Carr, Indianapolis (26); C. O. Stauffer, South Bend (29); Phil Cordes, Seymour (29); Back row: John Novotny, Gary (28); Howard Dodger, Angola (27); Calvin Ulery, Elkhart (26); Tom Ewing, Huntington (44); Preston Ake, Fort Wayne (40); H. A. Beaman, Noblesville (48).

told of the activity of the Construction League in supporting beneficial legislation and battling harmful laws. The important part played by the Indiana association in this campaign was described by the speaker.

Final speaker was Prof. W. T. Miller of Purdue. He thanked the association for the portrait which was re-

cently presented to him and told of his complete surprise at the gift. He then talked about his favorite subject, warm air heating, and answered a number of questions from the floor.

The convention closed Friday evening with the stag party sponsored by the Fur-mets.

Pennsylvania

THE PROGRAM for the coming convention of the Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania has been completed. The convention is to be held at the Hotel Brunswick, Lancaster, Pa.

Friday — March 30, 1951

10:00 a.m. Registration and Get-Together

12:15 p.m.

Address of Welcome — Paul L. H. Reine —

President — Chamber of Commerce

Invocation — Rev. Frank C. Torrey, D.D. —

Calvary Independent Church

Luncheon — Contractors — Robert Fulton Room;

Salesmen Auxiliary — Buchanan and Conestoga Rooms

1:45- 2:00 p.m. Opening Session — C. K. Rhoads, Convention Chairman

2:00- 2:30 p.m.

Report of President

Report of Secretary

2:30- 4:00 p.m. The Outlook for the Sheet Metal Industry — Panel Discussion

4:00- 5:00 p.m. Polishing the Crystal Ball — John E. Phillips

5:00- 6:00 p.m. Cocktail Party — Sponsored by the

Salesmen Auxiliary

6:00- 8:00 p.m. Free Time

8:00-11:00 p.m. Card Party and Get-Together —

Sponsored by the Salesmen Auxiliary

Saturday — March 31, 1951

9:30-10:00 a.m. The National Association — Joseph Wilder

10:00-10:30 a.m. Salesmanship in the Heating Industry — Harold Reese

10:30-11:30 a.m. Overhead — C. C. Sheppard

11:30-12:30 p.m. QUESTION BOX

12:30 Luncheon — Ball Room; Speaker — Scott Limbach; Subject — The European Resistance Movement — Its Problems and Potentialities.

2:00- 3:00 p.m. Committee Reports:

2:00-2:30 — E. W. Scarborough — Our Findings about Compensation Insurance

2:30-3:00 — Nominating, Auditing — Resolutions and Standing Committees

3:00- 3:30 p.m. Election of Officers; Selection of Convention City for 1952

3:30- 5:00 p.m. Open Forum

5:00 p.m. Adjournment

6:30 p.m. Banquet and Entertainment — Ball Room

(From page 109)

in the absence of the secretary-treasurer. The report showed net gain of \$397 for the year.

At this time president Bridges made several comments as retiring president whereupon he passed the gavel to president-elect Harry F. Haldeman, and the office of president was assumed by Mr. Haldeman with a few accompanying remarks.

President Haldeman then called upon Mickey O'Haver of Southern California Gas Co. who presented Ray Bridges with a token of institute's esteem in the form of a pen and pencil engraved desk set, and congratulated Mr. Bridges for an exceptional job done as president during 1950. Mr. O'Haver also pointed out that under the guidance of Mr. Bridges, the institute had shown a 10 per cent gain in membership and revenue.

President Haldeman introduced the new officers, board of directors, and chairmen of committees to function in 1951.

Pictures were taken of the new officers and board by Southern California Gas Co. for the record and for advertising and publicity purposes. The meeting was thereupon turned over to Sam Jaffe who as chairman of the Program Committee, introduced the speaker of the evening, Richard B. Morey, manager Los Angeles office, Allied Building Credits, who spoke on FHA Title I, how to obtain this business and how to process it.

Illinois

PROGRAM PLANS for the convention of the Sheet Metal Contractors Association of Illinois. The meeting will be held at the Hotel Jefferson, Peoria, April 2-4.

Events scheduled for the first day include an informative lecture on the proper servicing of controls and the traditional stag party.

Tuesday morning there will be a discussion of the current control situation in the metals field. A representative of the National Production Authority will be on hand to address the group. Feature of the afternoon session will be a talk on servicing automatic burners by Frank Mehrings of Peoria.

Wednesday morning the Sheet Metal Contractors National Association will present three speakers: J. D. Wilder, E. B. Brown, and N. J. Biddle. The banquet will be held Wednesday evening.

Indoor Comfort Conferences

- March 19-20—Kansas City, Missouri
W. R. Cameron, Missouri-Kansas Supply, 1725-31 Locust St.
- March 22-23—Salina, Kansas
Jim McKim, The Salina Supply Co.
- March 30-31—Boston, Massachusetts
T. F. Donahue, Jr., Herrick Co., 352 C St., South Boston
- April 2-3—New Haven, Connecticut

B. L. Fay, Norwalk Air Conditioning Corp., 138 Water St., S. Norwalk

April 5-6—Long Island, New York

C. W. Rand, Home Crafts Co., Floral Park, New York

April 9-10—Philadelphia, Pennsylvania

John E. Phillips, Stelwagon Mfg. Co., 19th & Washington Ave.

April 13-14—Baltimore, Maryland

W. E. Kingswell, W. E. Kingswell, Inc., 4020 Georgia Ave., N. W., Washington, D. C.

April 26-27—Rockford, Illinois

E. D. Mott, Mott Bros., 907 South Main St.

April 30-May 1—Milwaukee, Wisconsin

Fred J. Engler, Milwaukee Stove & Furnace Repair Co., 323 West Juneau Ave.

May 3-4—Minneapolis, Minnesota

Stuart A. Smith, Waterman-Waterbury Co., 1121 Jackson St., N. E.

May 7-8—Billings, Montana

Harry Hunt, Midland Implement Co., Heating Division

May 11-12—Omaha, Nebraska

L. C. Norton, A. Y. McDonald Mfg. Co., 1201 Dodge St.

May 14-15—Des Moines, Iowa

John C. Rehmann, Keith Furnace Co., Dean Ave. at E. 26th St.

May 21-22—Evansville, Indiana

George Saum, Plumbing and Industrial Supply Co., Inc.

May 25-26—Fort Wayne, Indiana

Cleo. G. Fox, Fort Wayne Heating & Sheet Metal Contractors Ass'n., 3209 Thompson Ave.

May 28-29—Detroit, Michigan

E. B. Root, Superior Safety Furnace Pipe Co., 5816-44 Forsythe Ave.

May 31-June 1—Bay City, Michigan

B. L. Lange, Wm. A. Lange & Son, 219-221 So. Hamilton St.

June 4-5—Kalamazoo, Michigan

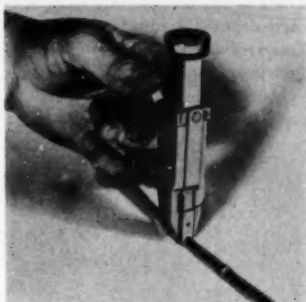
Glen W. Rynbrand, Glen W. Rynbrand Co., 2107 Schippers Lane

June 21-22—Utica, New York

I. C. Barber, International Heater Co., 101 Park Ave.

The registration fee for the two-day conference is \$12.50 per student. The fee includes tuition and the cost of all manuals and worksheets that the student will receive for classroom instruction. For further information regarding class location and hotel room reservation, write to the chairman of the conference you plan to attend.

EQUIPMENT DEVELOPMENTS



Automatic Tacker 24

A new pocket size automatic tackers was designed to cut costs and save time in making wire installations. Staples braided, rubber coated, single and double strand wire, and hollow tube lines. Front and rear guides circle the wire and permit rapid drawing around difficult angles or corners, along baseboards, plaster walls, window frames, ceilings, door jams, and rafters.

Uses an improved staple, made in several colors, whose driving points penetrate plaster, composition board, hard and soft woods. Drives the staple to a desired depth without marring or injuring the wire. Heller Co., Cleveland, Ohio.



Deep Throat Punch Press . 25

Improved 4 ton deep throat punch press has an open height, ram up, of 8 in., will punch to the center of an 18 in. circle. Frame construction has been strengthened at

(Use Coupon on this Page)

all stress points and a knockout has been added.

With the exception of the frame, trip link, and legs, all parts have been standardized and are now interchangeable with the regular 4 ton model.

Benchmark Mfg. Co., Los Angeles, Calif.



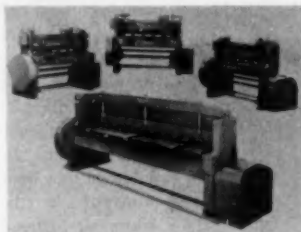
Room Cooler 26

A direct drive dual blower air cooler for cooling offices or single rooms is completely self-contained with a built-in pump and adjustable air deflecting grilles. The grille vanes may be turned in any direction, permitting desired diffusion of air.

Unit weighs 35 lbs, is 15 in. high, 21 in. wide, and 12 in. deep. Rating: 320 cfm at 1500 fpm velocity.

Window fillers are included with the cooler, making it adaptable to various size windows.

Palmer Mfg. Corp., Phoenix, Ariz.



Power Shears 27

Power squaring shears rated at 12 ga mild steel and 16 ga stainless steel are available in 52 in., 6 ft, 8 ft, and 10 ft cutting lengths.

Standard equipment includes motor with controls and electrical equipment; ball bearing, precision back gauge adjustable to 1/128 in.; two front gauge brackets and front gauge; side and bevel gauges; stainless steel scale embedded in table to aid in positioning sheets; slatted metal finger guard, and 4-edge blades. Wysong and Miles Co., Greensboro, N. C.

MAIL THIS NOW!

We will ask the manufacturer to send full particulars about the products and literature mentioned.

Be sure to circle the items you want.

3-51

Equipment Developments

24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	

New Literature

219	220	221	222	223	224	225	226
227							

Manufacturer ☐

Jobber ☐

Dealer ☐

Name

Company

Address

Address: AMERICAN ARTISAN, 6 North Michigan Ave.,
Chicago 2, Illinois

EQUIPMENT DEVELOPMENTS

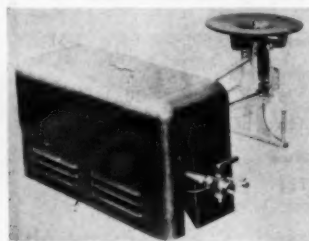
(Use Coupon on Page 115)

Reverse Flow Gas Furnace . 28

Features of a new gas fired reverse flow winter air conditioning unit include a rubber mounted blower, steel body and heat exchanger, air filter, built in warm air plenum, and automatic humidifier. In addition to a limit control in the warm air plenum, it has a limit control just under the blower and above the heat exchanger to prevent excessive heat from rising

when the blower is not running. Cabinet is 21½ in. wide, 27¼ in. deep and 72 in. high. Return air can be taken in the top or high on either side. Warm air comes out the bottom. Or, stub ducts can be connected low on either side for closet or alcove installations where the unit serves as a central furnace without long ductwork. All inspection and servicing can be done from the front.

Lennox Furnace Co., Marshalltown, Iowa.



Three Stage Burner 29

GC-31 gas conversion burner for natural, manufactured, and mixed gases provides modern three stage fire for old furnaces fired with solid fuels.

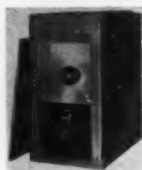
Features include a pilot igniter with push button control, automatic

gas safety pilot, automatic room thermostat, and an automatic electric gas valve which prevents the flow of gas if pilot is extinguished. Burner is AGA approved.

Perfection Stove Co., Cleveland, Ohio.

Oil Fired Heating Unit . . 30

A winter air conditioning unit with gun type burner is available in three sizes ranging from 100,000 to 200,000

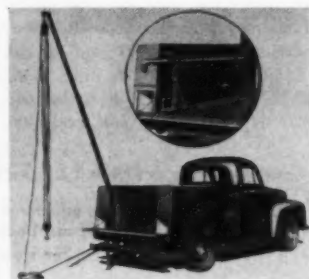


Btu output at register. Offers automatic temperature control, forced air circulation, air filtration, humidification, and automatic firing in one

package.

A particular feature is the burner drawer assembly which makes the combustion section readily accessible. Of interest also is the solid base pan which eliminates the entrance of basement dirt into the heating system.

Thermo-Products, Inc., North Judson, Ind.



Telescopic Derrick 31

A new telescopic, single leg derrick, for ½, ¾, and 1 ton trucks is designed for use with multiple pulley blocks. It has a maximum capacity of 1500 lbs. For convenience in handling materials of different size, weight, and shape the derrick base is keyed to permit positioning of the boom at two angles of elevation. In addition, the upper section of the boom may be telescoped for greater capacity when maximum height is not required.

The derrick is raised semi-auto-

matically by means of a heavy duty elevating spring. When not in use the boom is stowed in a telescoped position along the body side panel where it will not interfere with items carried in the loading area.

Powers-American Div., McCabe-Powers Auto Body Co., St. Louis, Mo.



Summer Air Conditioner . 32

Cooling unit, when teamed with a winter air conditioning system and connected to its ducts, will provide year round indoor comfort with mechanically cooled and dehumidified air. Owners may expect the same dependability received from home refrigerators.

Unit is hermetically sealed and tested at the factory. Dirt can't work its way in and the refrigerant can't leak out. Inlet and outlet duct connections flanged to permit quick and easy installation.

Air is cleaned by two large filters. All moving parts cushion mounted. Access for inspection and servicing.

During the heating season the winter air conditioning system operates in the normal manner. Cooling unit is shut off and a damper bypasses the air around the cooling coils.

American-Standard Corp., Pittsburgh, Pa.

Attic Fan Motor 33

New motor is designed for use with vertically or horizontally operated belt driven attic fans. The motor bearing construction is built to carry thrust loads caused by the

weight of rotor and pulley, and vertical operation of the motor with the shaft extension up or down is permissible.

Available as a split phase, 115 v, $\frac{1}{4}$ or $\frac{1}{2}$ hp, type FHT motor or as a capacitor start, 115/230 v, $\frac{1}{2}$ hp, type FJ motor. Temperature rating of type FHT is 50 C continuous, type FJ is 40 C continuous. Both types are externally reversible.

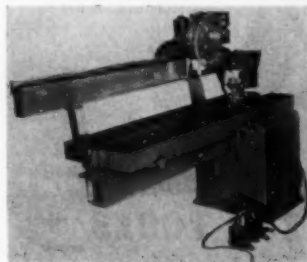
Westinghouse Elec. Corp., Pittsburgh, Pa.

Counterflow Furnace . . . 34

The Ranchief Counterflow, a conditioner designed specifically for perimeter type heating, is now available with a pressure oil burner in addition to the vaporizing oil and gas burners originally provided.

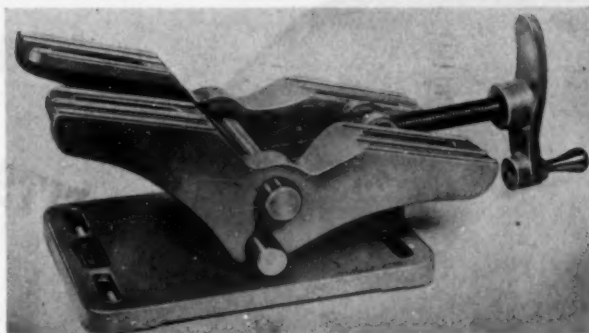
Unit features extreme compactness — 22 in. x 22 in. — and reduced clearance to combustible materials. It delivers 64,000 Btu on bonnet, either oil or gas fired, and is easily convertible from oil to gas.

Fully wired, packaged, and fire-tested at factory. The gas fired model is AGA approved, the oil models UL listed. Conco Engineering Works, Mendota, Ill.



Automatic Seam Welder . 35

A seam welder for automatically welding seams in metal ranging from 14 ga to $\frac{1}{4}$ in. is designed for welding cylinders or other hollow shapes. Can also be used to splice sheets



Adjustable Motor Base 36

A lightweight tilting motor base is adjustable in width and length to accommodate all sizes and types of fractional motors up to 1 hp. Used with variable speed drives and for easy belt changing on pulleys, unit acts as a belt tightener as well. A handle screw adjustment provides

exact speed control and changes while the machine is in use. Correct belt tension and alignment is constantly maintained.

Dimensions are $5\frac{1}{2}$ in. x 7 in., shipping weight, 10 lbs. Lovejoy Flexible Coupling Co., Chicago, Ill.

and through-weld flanges in making containers. Work up to 18 ft long can be handled and the machine can be extended to take longer pieces. Minimum diameter is 12 in.

Work is placed over the rigid box section horn and the two edges of the seam to be welded are gripped by pneumatically operated copper fingers. Clamping pressure of the fingers is provided by air tubes in a hollow box section weldment on top of the horn. An air operated copper anvil clamps tightly up against the back of the seam being welded. The fingers and back-up anvil clamp the work in exact alignment with a minimum of deflection and variation in area through the joint.

Machine can be used for automatic brazing or inert gas shielded arc welding on stainless steel and non-ferrous metals.

Cecil C. Peck Co., Cleveland, Ohio.

Metal Protective Paint . . 37

Chem-Rem (Chemical Remedy) acid and alkali resisting black paint has recently been improved by the addition of silicone, which provides smoother coverage and greater acid resistance. Increased water repellance is another feature.

Can be applied by brush, spray, or dip methods. Dries to the touch in one hour and sets in three hours. Speco, Inc., Cleveland, Ohio.

Gas Fired Furnaces 38

With the addition of two new sizes, type 110 gas fired winter air conditioner is now available in five sizes, from 60,000 Btu input to 160,000 Btu input per hour. The new models are type 110-120 and 110-160, with 120,000 and 160,000 Btu input respectively. They employ twin heat exchangers, burners, and blowers but operate with common manifold,



enclosed diverter, and blower motor. The heat exchangers are heavy gauge welded steel with thermodynamic design, with no open or gasketed joints in the air stream. Units are up draft design with flue passages at top connected to furnace at one end only, allowing free floating expansion of the flue passages independent of the combustion chamber.

L. J. Mueller Furnace Co., Milwaukee, Wis.

FITS THE HAND
FITS THE WORK
FITS THE BELT

● Here's one of the finest tools ever to bear the Crescent name. It's an improved, easier-to-use CRESTOLOY Round Nose Lineman's Pliers...streamlined for better handling, better work and easier carrying in the belt. Forged from special "Crestoloy" steel, it's two ounces lighter, yet just as strong as the heavier conventional model. Its cutting edges are carefully hand-honed to provide lasting sharpness. The milled teeth in the nose assure a non-slip grip on wire or other work. The handles fit the hand "like a glove."

This tag says
"PRETESTED"

It guarantees that each individual tool tested 100% satisfactorily before it left the factory.



No. 2150

Crestoloy® Lineman's Pliers. Available also with insulated handles.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

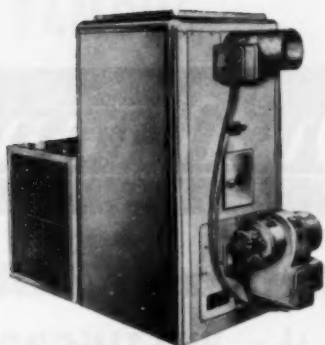
"Crescent" is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by Crescent Tool Company, Jamestown, N. Y.

CRESCENT TOOLS

Give Wings to Work

*Sign of the Artisan
 Symbol of Excellence*





Delco-Heat "OPC" Conditionairs—a value-priced line of forced air furnaces with pressure atomizing oil burners. Blower filter unit may be bottom or back mounted. "Reverse flow" model, and de luxe model with matching blower and furnace units, also available.



Delco-Heat "OVC" Conditionairs—especially low-priced models for the builder and small home markets. Two stage vaporizing oil burners. "OVC" Conditionairs come in both gravity and forced air models.



Delco-Heat "DA" Conditionairs—the finest oil-fired, forced warm air furnaces available! Five models in capacities from 85,000 to 200,000 Btu output. Powered by famous Delco-Heat "Rotopower" oil burners.



*Also manufacturers of electric water systems
for farms and homes*

The Delco-Heat line offers features that sell —at prices that mean profits!

A new home heating unit isn't an "everyday" purchase to your customers — it's a major investment. Naturally they look for a name they can trust. They insist on top quality and dependability. And they want all this at the lowest possible cost.

When you sell Delco-Heat Conditionairs, you are able to offer unmatched quality and dependability. *Yes Delco-Heat units are priced competitively.*

Yes, it's easier to sell the products of a manufacturer whose research, engineering and advertising facilities will keep those products out front. And Delco Appliance, a division of General Motors, is just such an organization.

Delco Appliance, following the General Motors' policy of "more and better things for more people," manufactures the kind of automatic heating equipment that customers want — at prices they can afford to pay. This policy is one on which each Delco-Heat Retail Distributor can base a sound business for himself.

If you are interested in more information about
a Delco-Heat franchise, send the coupon below.



CLIP AND MAIL TODAY!

DELCO APPLIANCE DIVISION, D-pt. AA-23
General Motors Corporation, Rochester 1, N. Y.

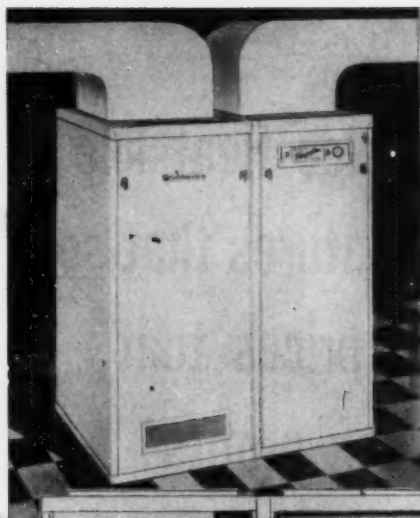
Please send me information about a Delco-Heat franchise.

Name

Firm Name

Street

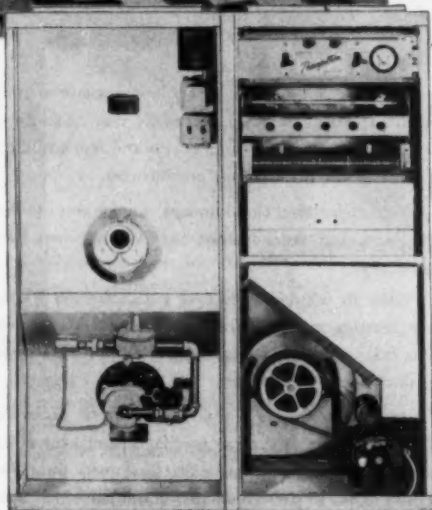
City Zone State



The Dualtron®

CLEANS as it HEATS
with the WESTINGHOUSE

Precipitron



Heating Unit The Precipitron
GAS OR FUEL OIL

DUALTRON is a new—but thoroughly proved—system of heating, combined in a single, compact, space-saving unit with the famous Westinghouse Precipitron. It cleanses air electronically—removes up to 90% of the damaging dirt before it gets a chance to enter the heating system.

DUALTRON then heats the clean air automatically, with an efficiency that brings new comfort in any degree of winter weather. It's all one operation.

LESS CLEANING — No constant, heavy house cleaning. Draperies, furniture coverings, rugs and walls stay clean and fresh for unbelievably long periods.

MORE COMFORT—No sudden gushes of warm air, alternating with cold drafts. Heat flows evenly, gently. Humidity is maintained at correct levels — you breathe clean, moist air.

*Architects
and Contractors*

ARE WELCOME TO
OUR ENGINEERING SERVICE

The DUALTRON Company

322 Perry Highway

Pittsburgh 29, Pa.

Phone Wellington 1-2021

FAMOUS WISS metal cutting snips for every purpose



METAL MASTER SNIPS

Outstanding new development in snip design and construction. Compound leverage produces amazing cutting power with minimum effort. For the most intricate jobs involving inside holes, circles, complicated patterns, etc. Overall length 10". Rubber grips recommended.

INLAID BLADE STRAIGHT CUTTING SNIPS

The basic snips for straight metal cutting. Gun metal finish handles. Tough crucible steel inlaid blades. Popular because of cutting ease and long life. 5 sizes from 9½" to 14½" long.

INLAID BLADE COMBINATION SNIPS

Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight. 2 sizes—12½" and 13½" long.



STRAIGHT CUTTING SOLID STEEL SNIPS

For workers who do not need the special qualities of Wiss inlaid snips. They meet government specifications. For garages, machine shops, home workshops, the farm, etc. 4 sizes from 8" to 12¼" long.

COMBINATION CUTTING SOLID STEEL SNIPS

Strong, well made, solid steel combination pattern snips. Will cut curves and irregular shapes with ease. Accurately tempered jaws and strong bolts. No. V19 13" long, 3" cut. No. V13 is handy pocket size, 7" long, 1½" cut.

INLAID BULLDOG HEAVY-DUTY SNIPS

For cutting monel metal, stainless steel, Allegheny metal and other tough alloys. Invaluable for bench work for cutting strap iron bands. Regularly tested on 18-gauge galvanized iron. 17" long, 2½" cut. Also made in popular 16" size of solid steel No. A16.

Quality for more than a century

J. WISS & SONS CO., NEWARK 7, NEW JERSEY

**"WHO'D BE WILLING
TO BOTHER WITH
SUCH A SMALL
STEEL ORDER?"**



**"U. S. STEEL SUPPLY!
THEY'VE ALWAYS BEEN
INTERESTED IN
SMALL BUYERS
AS WELL AS LARGE."**



...your best source of supply...

UNITED STATES STEEL SUPPLY COMPANY



Warehouses and Sales Offices: BALTIMORE • BOSTON • CHICAGO • CLEVELAND • LOS ANGELES • MILWAUKEE • MOLINE, ILL.
NEWARK • PITTSBURGH • PORTLAND, ORE. • SAN FRANCISCO • SEATTLE • ST. LOUIS • TWIN CITY (ST. PAUL)
Sales Offices: INDIANAPOLIS • KANSAS CITY, MO. • PHILADELPHIA • ROCKFORD, ILL. • TOLEDO • TULSA • YOUNGSTOWN

Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

UNITED STATES STEEL

NEW

NIAGARA

SERIES 40-G
Gas-Fired

STEEL GRAVITY FURNACES



***Factory
Assembled***

**delivered in a
single carton ready for
speedy installation**

Available NOW in three sizes—
input AGA 60,000, 80,000 and
105,000 BTU—these new, com-
pact units are ideally suited to
modern needs for automatic
gravity furnaces.

*Write for catalog sheet giving
specifications.*

NIAGARA FURNACE DIVISION • The Forest City Foundries Company
2500 West 27th Street • Cleveland 13, Ohio

NIAGARA makes all 3: Gas • Oil • Coal Furnaces • Cast Iron or Steel

UTILITY AIR COOLERS SOLD OUT IN '50

Order Early... '51 will be Another Big Year for Utility Evaporative Air Coolers

HISTORY'S HIGHEST PRODUCTION wasn't enough to fill the demand for Utility Coolers last year. With design refinements head and shoulders above the field, with advertising "show-casing" them to consumers, Utility Coolers sold faster than we could make 'em in 1950. Right now it looks like an even bigger year in '51. We sincerely advise you to order *now* and order *enough*. Remember, Utility gives you a double-barrelled shot at year-round volume... the nation's top line of coolers in the summer, an equally respected line of gas furnaces and gas heaters for winter sales.

A COMPLETE, LOW-COST COOLING LINE

- Portable Blower Model: Low-cost, efficient cooling for small rooms.
- Fan Model Series: Deluxe fan cooler with built-in re-circulating pump.
- Duct Coolers for small areas: 10" and 12" blower wheels.
- Duct Coolers for homes of any size: 7 models, 16" to 19" blower wheels.
- Duct Coolers for commercial and industrial uses: 6 models, 22" to 26" blower wheels.



THIS SEAL MEANS
SATISFACTION TO YOUR
CUSTOMERS... easier
selling for you.

CHECK THESE EASY-SELLING FEATURES

- | | |
|--|---|
| <p>✓ Dynamically-balanced oversize blower wheels for greater air delivery, lowest operating cost.</p> <p>✓ Uniflow Water Distribution assures continual flow, even water distribution across entire pad surface.</p> <p>✓ Pure aspen filter-pads in patented, no-sag racks, positioned for positive wetting action.</p> <p>✓ Seal-Bonded finish throughout for corrosion resistance.</p> | <p>✓ Water-resistant pump motor housing... adjustable pitch motor pulley... micrometer adjustment hose clamp for easy installation of recirculating pump.</p> <p>✓ Completely assembled (except models with blower wheels over 16")... factory tested... guaranteed one year.</p> |
|--|---|

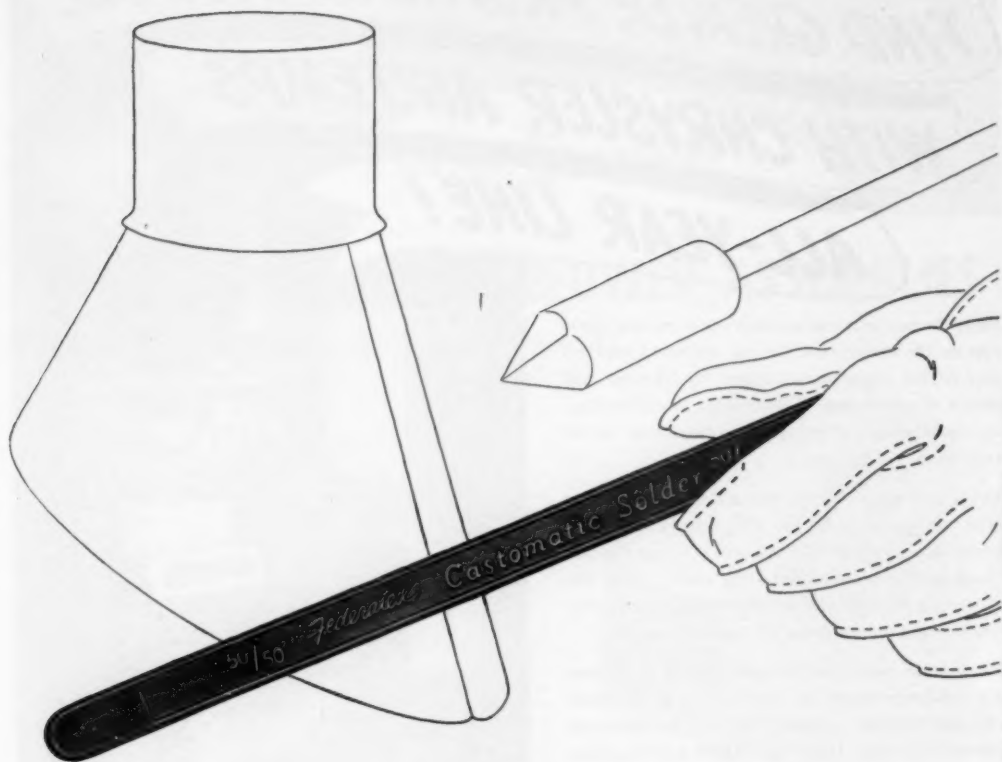
THERE'S PROFIT



IN THE AIR

UTILITY APPLIANCE CORP. • 4851 So. Alameda Street • Los Angeles 58, Calif.

Manufacturers of gas-fired heating equipment and Gaffers & Sattler and Occidental Gas Ranges



What Makes a MACHINE-CAST SOLDER Better?

When we say "machine-cast" we mean Federated CASTOMATIC Solder, the only bar solder cast automatically.

CASTOMATIC is better... patented CASTOMATIC machines make a dross-free solder... harmful oxides are excluded from the completely pressurized system.

CASTOMATIC is extra fine grained... has no voids or segregation to slow down your sheet metal work. Every bar of a given analysis melts at the same temperature... you work faster, more freely, without costly interruption.

CASTOMATIC solder is available in all standard sizes and compositions through your local jobber.

Federated Metals Division



AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.

FIND GREATER PROFITS IN FIFTY-ONE WITH CHRYSLER AIRTEMP'S ALL-YEAR LINE!

Make the new year one to remember—one that starts you on the springboard to real success. Check up now on the opportunities offered by Chrysler Airtemp's all-season line . . . a complete line of heating, air conditioning and refrigeration equipment to sell every month of the year.

You'll find there's added business volume—greater profit for *you*—under the Chrysler Airtemp sign. Here's your chance to sell the nation's most popular "packaged" air conditioner—the world's finest line of heating equipment—dehumidifiers—commercial refrigeration units—room air conditioners.

Every home owner and business man in your town is a red-hot prospect for one or more of the many Chrysler Airtemp products. Yes, sell the finest and you earn the most. Don't wait. There may be a franchise open in your territory. Mail coupon today.

AN ALL-STAR, ALL-SEASON LINEUP:

Gas, Oil and Coal-Fired Winter Air Conditioners • Gas and Oil-Fired Boilers • Oil, Gas and Electric Water Heaters • Conversion Gas and Oil Burners • Coal Furnaces • Year-Round Air Conditioners (Heats and Cools) • Stokers • Filter Blower Units • Electric Air Filters • Room Air Conditioners • "Packaged" Air Conditioners • Dehumidifiers • Commercial Refrigeration • Condensing Units • Central System Cooling Equipment • Marine Refrigeration

MAIL TODAY FOR FULL DETAILS!

Airtemp Division of Chrysler Corporation AA-3-51
Dayton 1, Ohio

Please rush me full details about Chrysler Airtemp's wonderful new year Franchise opportunity.

Name

Address

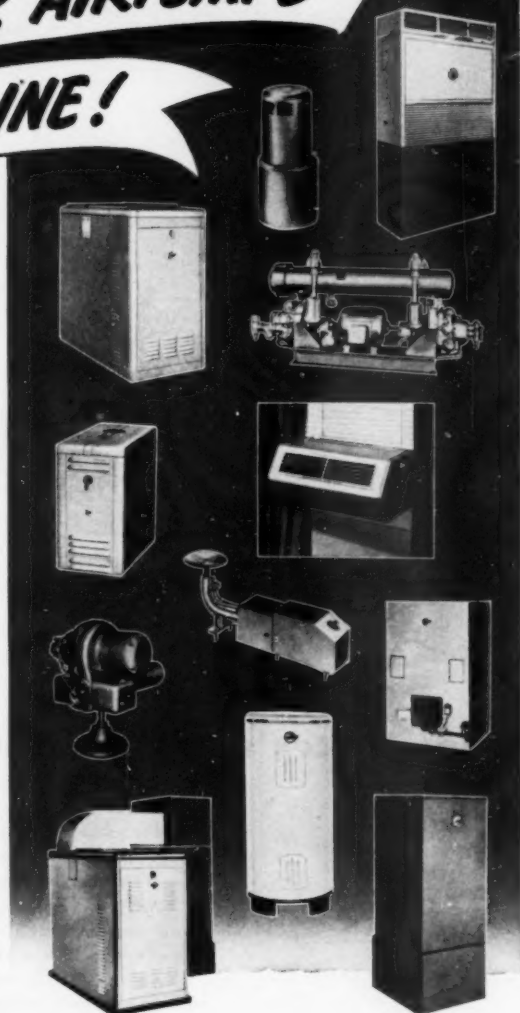
City Zone State



Chrysler Airtemp

AIR CONDITIONING • HEATING • COMMERCIAL REFRIGERATION

Airtemp Division of Chrysler Corporation, Dayton 1, Ohio





... and Now *Brundage*

SERIES "X" BLOWER ASSEMBLIES

UNEQUALED IN PERFORMANCE
UNMATCHED IN EFFICIENCY

Features . . .

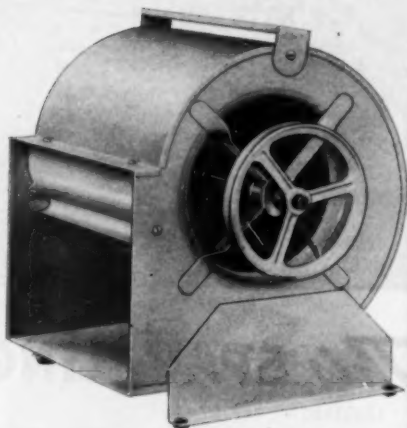
BLOWER WHEEL: Duo-multiblade wheel, statically and dynamically balanced. Staggered, half blades hot riveted to center disc and outer rims.

SCROLL: Heavy gauge, cold rolled steel housing engineered and designed for maximum efficiency of blower wheel.

BEARINGS: Self-aligning, readily accessible, spherical units with increased oil reservoir cushioned in shock-resistant Neoprene sleeve.

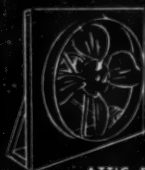
BEARING SUPPORT BRACKET: Four-point suspension. Arms securely attached to side-plates by special welding process. Same bracket applicable to any style of discharge.

MOTOR MOUNT: One-piece, reinforced, bridge-type applicable to any style of discharge or motor location.



Year after year Brundage has demonstrated an unusual ability to offer furnace manufacturers EXACTLY what they require in blower performance and construction. Now, with the new Series "X," Brundage points the way to even greater efficiency in air handling.

Investigate the broad range of sizes and styles. Write today for complete engineering data.



ATTIC FAN



FURNACE BLOWERS



SPECIAL BLOWERS



EXHAUSTERS

Brundage
COMPANY

*Blower Specialists
Since 1919*

516 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN

EQUIPMENT



This SPARKLING SURFACE *Helps to Sell Your Jobs*

Never underestimate the sales appeal in the gleaming good-looks of Bethlehem Galvanized Steel Sheets. Their clean, bright coating adds considerably to the appearance of any sheet-metal job.

But, important as appearance is, Bethlehem Galvanized Sheets have other noteworthy features that can't be detected by the eye alone. They have the strength and stiffness found only in steel. They have excellent workability and do not require special handling or unusual methods of fabrication. Long service life is assured by their tight uniform coating of Prime Western zinc.

As far as cost is concerned Bethlehem Galvanized Steel Sheets sell for considerably less than sheets of equal gages made from other metals.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation.

Bethlehem
GALVANIZED
Steel Sheets



why sell just "furnaces"—

when you can sell *Shirtsleeve Comfort*



Oh, man!—how's this for a picture of *Shirtsleeve Comfort*? Pretty solid, isn't it?

Mister, that's what you've got to sell—*what will sell for you!*—when you handle Ingersoll Heating Equipment. That's because *Shirtsleeve Comfort* is engineered right into all Ingersoll units.

Whether for gas, oil or coal, gravity or forced air, big job or little, every Ingersoll unit is designed and built for better performance, longer life, lasting comfort. And there's a model and size for practically every warm air heating need.

To help speed your sales and profits, there's a big array of hard-hitting sales and advertising helps, cooperative ad plan, factory engineering assistance on the tough jobs. *Plus* the reputation of Ingersoll and Borg-Warner for finest quality products to back you up all the way.

So why sell just "furnaces" when you can really go places with *Shirtsleeve Comfort*—against any kind of competition! Mail that coupon down in the corner for all the interesting details.

**DISTRIBUTORS
—DEALERS!**
Mail coupon
for details

© 1951 INGERSOLL PRODUCTS DIVISION



INGERSOLL PRODUCTS DIVISION
Borg-Warner Corporation
Kalamazoo, Michigan



INGERSOLL PRODUCTS DIV., Borg-Warner Corp.

Dept. AA-1 Kalamazoo, Michigan

We're interested! Rush literature and details for:

☐ Franchise Distributorship

☐ Dealer

Send us literature, too!

☐ Architect

☐ Contractor

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

For the right
slant on your
reputation...



Hoover®

ELECTRIC MOTORS

When you install, specify or recommend heating, ventilating or air-conditioning equipment, you know your own good name depends on that installation's giving top-notch, reliable performance. That's why so many builders, contractors and engineers pick Hoover Motors to power their installations.

Hoover general-purpose motors are famous for long, quiet, dependable service. They're built like motors costing far more. And, whatever your requirements, there's almost sure to be either a general-purpose or special-purpose Hoover Motor to fit them—as you can see from these specifications:



1. CAPACITOR-START MOTORS for hard-starting, continuous-duty applications such as compressors, machine tools, and pumps. Rigid or resilient mounted, sleeve or ball bearings, $\frac{1}{4}$ through 1 HP. Rigid-mounted ball bearing only through 3 HP.

2. POLYPHASE MOTORS for use where three-phase supply lines are available. Start without reduced voltage compensator. Low-cost operation. Rigid mount or resilient mount, ball bearings, or sleeve bearings, $\frac{1}{4}$ through 1 HP. Rigid-mounted ball bearing only through 5 HP

Besides these general-purpose motors, there are other Hoover Motors designed especially for pumps, oil burners, fans and blowers. Write for details.



THE HOOVER COMPANY

Kingston-Conley Division
68 Brook Avenue
North Plainfield, New Jersey

This superb line of IRON FIREMAN FURNACES offers new dealer opportunities

WHETHER the fuel burned is coal, gas, or oil, Iron Fireman furnaces provide dependable, economical heating comfort through Iron Fireman Radiant firing. Efficient Radiant firing produces *Radiant* heat—the type most readily absorbed by the furnace's primary heating surfaces.

Iron Fireman has ready for you an extensive line of modern gravity and forced warm air furnaces. Built into each is many years of experience in designing and building automatic heating units. In styling, Iron Fireman furnaces reflect good appearance, based on modern functional design.

Products of one of the world's largest manufacturers of automatic heating equipment, Iron Fireman furnaces are outstanding for their reliable operation, economy, long life, and durability.

THE MOST COMPLETE FRANCHISE IN THE ENTIRE AUTOMATIC HEATING FIELD!

1. The unique features and outstanding fuel economy that are built into Iron Fireman Radiant fired furnaces make them easy to sell.
2. The Iron Fireman trademark, with 26 years of continuous national advertising and user satisfaction behind it, gives all Iron Fireman equipment exceptional salability.
3. Iron Fireman has a full line of heating equipment—Residential, Commercial, and Industrial—for all fuels.
4. Iron Fireman dealers receive strong company backing, which includes local advertising, merchandising, sales training and engineering assistance.

**Excellent territories are still available
in our expanding dealer organization.
Send coupon for full information.**

IRON



FIREMAN

IRON FIREMAN GAS FURNACE

Wide range of models cover all residential requirements. Built-in Radiant gas firing unit. One-piece furnace body of electrically welded heavy gauge steel. Handsome cabinet has baked-enamel finish. Impressive record of fuel economy in thousands of homes. AGA input rating from 70,000 to 195,000 Btu.



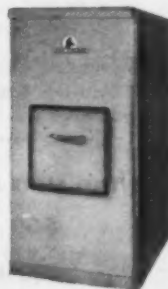
IRON FIREMAN OIL FURNACE

Automatically warms, cleans, circulates and humidifies the air. Has built-in Radiant Vortex oil firing unit for outstanding fuel savings and performance. One-piece furnace body of electrically welded heavy gauge steel. Available in a wide range of sizes from 85,000 to 270,000 Btu. at bonnet.



IRON FIREMAN COAL FURNACE

with built-in Iron Fireman stoker. Here is residential coal firing at its best. Feeds direct from bin to fire—no coal handling. Exclusive down-draft jet greatly increases radiant heat release, saves up to 25% of coal as compared with old style stokers. Forced circulation of humidified warm air. Sizes from 130,000 to 270,000 Btu. at bonnet.

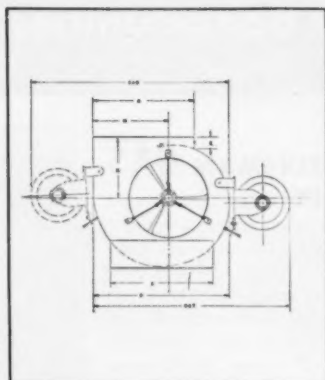


IRON FIREMAN MFG. CO.
3201 W. 106th St., Cleveland 11, Ohio

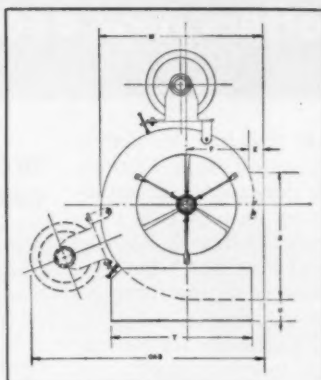
Please send me complete information on Iron Fireman warm air heating equipment, dealer franchise, and territories available.

Name _____
Address _____
City _____ State _____

Morrison Helps You Standardize Your Requirements



Vertical Discharge



Horizontal Discharge

WHEN YOU BUY COMPLETE

1000 BLOWER ASSEMBLIES (500 EACH VERTICAL & HORIZONTAL)

WHEN YOU BUY— @ \$14.00 MONEY INVESTED \$14,000.00

1000 Wheels and Parts MONEY INVESTED 7,000.00

*But . . . Note Flexibility of Application to Actual Sales
(example)*

ACTUAL SALES MAY HAVE BEEN

200 Vertical Discharge 800 Horizontal Discharge

When you buy complete, you are NOW

300 Units over on Vertical Discharge @ \$14.00 = \$4200.00

300 Units short on Horizontal Discharge

When you build your own, to actual sales requirements, you have

500 Vertical Discharge

500 Horizontal Discharge

YOU HAVE NO \$4200.00 DEAD INVENTORY . . . NO 300 UNIT SHORTAGE

Send today for Morrison Catalog with complete Morrison story

MORRISON PRODUCTS, INC.

16816 WATERLOO ROAD
CLEVELAND 10, OHIO

These were 1950

Champions



in football
U. of OKLAHOMA



in baseball
NEW YORK YANKEES



in ice hockey
DETROIT RED WINGS



in basketball
BRADLEY UNIVERSITY

in Furnaces...

SEQUOIA'S New Horizontal Model



• Illustrated:
Model H-80

All year long Sequoia jobbers and dealers rang up extra profits with new Series "H" gas furnaces—the space-saving horizontal units that sell faster, easier... serve with complete satisfaction wherever installed.

Sequoia horizontals are offered in three popular sizes for both residential and commercial heating—80,000, 100,000 and 120,000 BTU. Their compactness of construction (Model H-80 is 16 1/2" x 16 1/2" x 50" over-all) further reflects Sequoia's continued leadership in gas furnace engineering.

If you—Mr. Dealer—did not share in the flood of orders that made Sequoia Series "H" a 1950 champion best seller... prepare now for a profitable '51. Place an order immediately with your jobber, or write directly to the factory for complete details of the full Sequoia line.

All controls compactly grouped—positioned for ready access.

Attractive green enamel finish on heavy-gauge, scale-free steel casing.

Blower wheel and motor rubber-mounted for quiet, vibration-free operation.

Factory tested, completely wired and assembled before shipment.

symbol of  engineering leadership

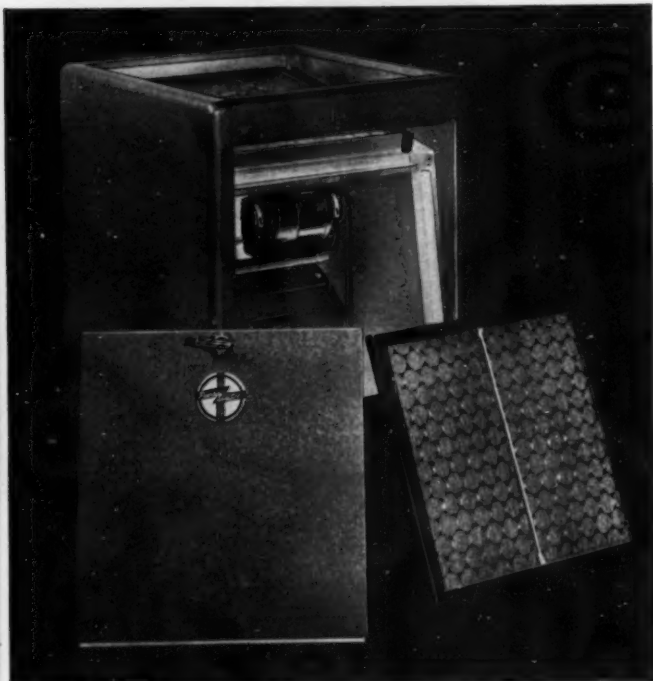
SEQUOIA MANUFACTURING COMPANY

1000 Brittan Avenue, San Carlos, California

MAKE *Peerless Electric* YOUR HEADQUARTERS FOR PACKAGE UNITS AND BLOWERS

For 58 years Peerless Electric has been designing and building quality fans, motors and other electrical equipment. This half-century of experience stands behind Peerless Blower Units and is your assurance of quality products that give long, trouble-free

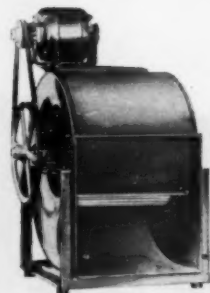
service. Peerless Blowers, including the motors, are manufactured entirely in our own modern plant. Peerless is not just an *assembled* line — another reason why Peerless Blowers are the preferred blowers on many nationally-known heating units.



Peerless Electric Package Blower Filter Unit

A Complete Unit including Filters Ready for Installation
Clean, Modern Design • Baked Enamel Finish
Heavy Gauge Steel • Balanced Wheels
Quiet Operation • Large Access Door • Easily Serviced
Direct or Belt Drive

This Peerless Electric Blower is available with wheels 10" in diameter providing 1,000 CFM up to wheels 21" in diameter providing 6,600 CFM. Bonnet control is furnished as an extra if desired.



Peerless Electric Belt Drive Blower Assemblies

These belt drive assemblies without casing or filters, can be furnished with either top or rear mounted motors. Designed for building into the furnace or for those installers who make up their own cabinets. Capacities 1,000 CFM to 6,600 CFM.



Peerless Electric Direct Drive 3-Speed Blower Assemblies

Twin Blowers • Three-Speed Peerless Motor
• Only Two Bearings • Resilient Mounted
Base • Quiet Operation • No Belts or
Pulleys • Compact Assembly

The Peerless Electric direct drive, 3-speed blower assembly is the answer to modern warm air heating. This unit is a natural for continuous air circulation which keeps a home comfortably heated without "cold spots." Blower wheel sizes 6" to 11". Capacities 800 CFM to 2,000 CFM.

THE PEERLESS ELECTRIC COMPANY • Established 1893 • WARREN, OHIO

Peerless Electric MOTORS • FANS • BLOWERS

WATER DROPS IN PAN—AFTER IT IS SIZZLING HOT...

... At pre-selected speed, water drips through funneled orifice into stainless steel pan. Water does no spray or run.

NO STAGNANT POOL TO RE-HEAT

Only a thin film of water forms in pan. Pan heats extremely fast. Water vapor is formed quickly—more efficiently.

EACH DROP OF WATER VAPORIZES AS IT HITS PAN...

Water drips into fast heating pan—one drop at a time—gets almost immediate vaporization.

1 KIT TO PURCHASE

All accessories are contained in one compact unit. Easily assembled. Economical to use—quick to sell.

12 PAN SIZES...

Quickly installed in any type warm air furnace.

SUPER-SENSITIVE THERMOSTAT...

Fool-proof. Gives immediate response to temperature change. Starts and stops flow of water according to bonnet temperature.

OUTSIDE SCREW ADJUSTER...

Easily reached. Permits fingertip control of water flow. Lock nut assures hairline regulation.

EASY INSTALLATION

Pans rest directly on combustion dome for most efficient operation. Can be suspended in plenum chamber, if necessary.

8 Ways Better

THERMO DRIP Automatic HUMIDIFIER

● Even with hardest water, Thermo-Drip gives fast, more efficient vaporization. Fool-proof thermostat permits quicker, more positive vaporizing action.

Simplicity of construction insures long life—easy servicing. There are no unnecessary parts—no extra, clumsy bulk. Too, with Thermo-Drip there is *no electrolytic action—no clogging of valve.*

Write TODAY for FREE literature. Dept. A-31

AUTOMATIC HUMIDIFIER CO. Cedar Falls, Iowa

WALKER

Automatic
DRAFT REGULATORS

by Trade Standards

There's no hesitation when architects, engineers and heating men need a draft control to do a job RIGHT. They specify WALKER... long known as the standard of quality.

From the small Space Heater to the giant Industrial Boiler, Walker Controls assure maximum fuel combustion under all stack conditions. That prevents unnecessary heat loss up the chimney... gives up to 25% fuel saving and increases all around heating performance.

What's more, there's a Walker Regulator for every domestic and commercial need... sizes from 6" to 36". Each is easily installed, guaranteed and sensitive for a lifetime.

Get all the facts on the Walker line of draft controls NOW without obligation to you. Write today to:

WALKER MFG. & SALES CORP.

Dept. 407, 1701 Penn St., St. Joseph, Mo.



**WITH THE AMAZING
NEW FRICTION FREE
BOX HINGE**

Seals bearing points from soot, moisture and rust. Won't clog or stick. Maintains positive draft values exactly as adjusted.

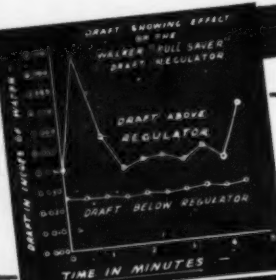
**Over 7,000,000
IN USE**

Check These Performance Charts



WALKER TYPE 34

For any type domestic furnace, stove or hot water heater. Sizes from 6" to 20". Shown with installation collar. Dampener section available separately if desired.



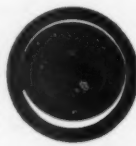
WALKER TYPE 34S

Adjustable, junior model. Sizes 3" to 3" available complete with low joint. Dampers 3" to 10" available with collar. Adjustment range—.01 to .12 inches WG.



WALKER TYPE 34C

Dial and pointer screw adjustment, junior model. Sizes 4, 6, 7, and 8 inches. Range in draft values: low-.015, medium-.045, high-.07 WG. Other draft values furnished to order.



WALKER TYPE 34PS

Pre-set at factory for one value. Junior model. Sizes 6" to 8". Standard draft setting is .04 inches WG. Special controls can be furnished to manufacturers specifications.



COMMERCIAL and INDUSTRIAL

For apartments, schools, industrial plants, garages, and other commercial uses. Bell Bearing. Sizes from 16" to 36".

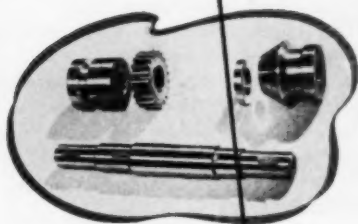


World's largest factory producing Automatic Draft Regulators exclusively.

We are not competing directly or indirectly with the producers of any type of heating equipment.



**FLAGLER "22"
MAKES OVER 1000
DRIVE CLEATS PER
HOUR (As Short As 4")**



The 3-piece shaft assembly is typical of the cost saving construction—each of the 12 shafts or spindles have separate roll and gear which are keyed on. No need to replace the whole unit when a roll or gear becomes excessively worn. All models have double spindles—all rolls powered, no idler rolls—all rolls quickly detachable—all spindles and rolls hardened.

TORRINGTON NEEDLE BEARINGS are shown inserted in bearing retainer holes of side plate—smooth operation assured—better locks every time.

Flagler machines have cut costs up to 1400% over other methods. If your shop lacks only a Drive Cleat and Double Seam Machine investigate the Flagler "22" or "24"—both may be equipped with any two sets of standard rolls. Send for Bulletin 950—gives the whole story!



**CONTACT US ON SPECIAL
LOCK ROLLING PROBLEMS!**

ROY G. FLAGLER MFG. CO.

INC.
19325 FILER AVE.
DETROIT 34, MICH.
Twainbrook 3-3161

☐ ROY G. FLAGLER MFG. CO., Inc.
 Detroit 34, Mich.
 Send more information on Model 24 ☐
 Model 22 ☐ Model 20 ☐
 Have your dealer contact us ☐
 Name
 Title
 Company
 Address
 City State

GET YOUR COPY OF THE **NEW 1951 H&C CATALOG**



A RELIABLE GUIDE
to the best Registers and Grilles
for every type of installation.
Also quality-built furnace
accessories.

Ask your Jobber

for a copy, or write directly to us. Also available is
our "Pocket Guide" — Eighth Edition — a convenient-
to-carry miniature catalog of the H & C line.



**HART & COOLEY
MANUFACTURING CO.**

500 East Eighth Street
HOLLAND, MICHIGAN
WORLD'S LARGEST MANUFACTURERS
OF REGISTERS • GRILLES • AND
FURNACE ACCESSORIES

IN CANADA: HART & COOLEY MANUFACTURING CO.
FORT ERIE, N. ONTARIO

NEW LITERATURE

(Use Coupon on Page 115)

Bending Manual 219

A new 32 page bending manual entitled *It's Easy to Bend* discusses product design, selection of material, choice of bending machine, and tooling the bender. Includes sections on centered eye and off-center eye bending; circle and zero radius bending; tube bending; special setups, etc.

Booklet is printed in two colors, includes specifications and capacities, is illustrated with photographs and line drawings.

O'Neil-Irwin Mfg. Co., Lake City, Minn.

Aluminized Steel 220

Steel with a special coating of aluminum is discussed in a new 24 page booklet entitled *Armco Aluminized Steel*. Booklet describes the steel's aluminum surface, its heat and corrosion resistance, and outstanding heat reflectivity. Photographs and a listing of applications show where manufacturers have used aluminized steel in a wide variety of products.

Also included are data on mechanical and forming properties, available sizes and gauges, as well as detailed recommendations for welding by various methods, brazing and finishing.

Armco Steel Corp., Middletown, Ohio

Dust Control Data 221

Detailed selection, operation, and maintenance data on dust control is contained in a 50 page, 5 in. x 7 1/4 in. digest size book entitled *Industrial Dust Control Through Exhaust Systems*. Book treats, in three major sections, 1) Exhaust Hoods and Piping Systems, 2) Dust Collecting Equipment, and 3) Exhausters and Drives.

The chapter on exhaust hoods and piping systems discusses control of air movements, recommended hood and enclosure design and arrangement, exhaust air velocity and volume, and eight rules for installing industrial exhaust system piping.

A 16 page illustrated section on dust collecting equipment gives seven factors which influence its installation and includes descriptive and application information on various types of dust collecting equipment.

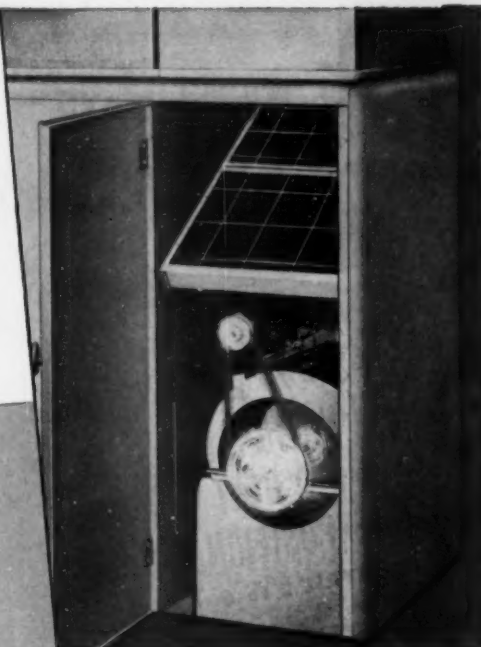
The chapter on exhausters and drives tells how to determine exhauster capacity by considering the total air volume to be handled and the total air flow resistance of the system. Types of exhausters, drive recommendations, and exhauster and motor foundation and housing requirements are also discussed in this section.

Pangborn Corp., Hagerstown, Md.

End Motor Failures Due to **DUST**

Get the Facts on EMERSON-ELECTRIC'S New Dustproof Centrifugal Starting Switch

PATENT APPLIED FOR



The furnace blower is but one of many motorized applications where dust or other solid particles, in the atmosphere, create an operational hazard to motor life.

Your blowers, appliances or power tools will have a competitive advantage, with this new feature.

This is important *news* for every user of general-purpose split-phase or capacitor-start ventilated motors! Emerson-Electric's uniquely shielded starting switch was originally designed for power saws—which operate under the most difficult conditions. In addition to the excellent results reported on saw motors in daily service, tests have been conducted even to the extreme of pouring saw dust into the ventilated openings, while the motor is operating, without hindering the switch action.

This improved switch involves no change in external motor dimensions, internal design (other than parts shown), or motor performance... it is readily adaptable to any Emerson-Electric general-purpose motor employing a cutout switch. It will eliminate motor failures caused by dust, dirt or lint on switch contact points.

For complete information, write for Motor Data Bulletin No. 118.

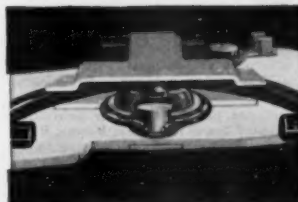
THE EMERSON ELECTRIC MFG. CO.

St. Louis 21, Mo.



Before:

Standard-type starting switch, mounted on inside of motor end shield, has exposed contact points. Dust entering through end-shield vents may lodge on points and prevent contact... a possible cause of motor failure.



After:

Vital contact points are completely shielded. Insulating and metal washers are held firmly against the lower rim of the shield by a spring arrangement. This view shows shield, washers and spring cut away to show how they protect contact points.

EMERSON
MOTORS • FANS



ELECTRIC
APPLIANCES

OT *

SERVICEMAN SAYS —



**"If you want answers
you have to ask
questions..."**

"Every time I get to the show I like to try to give the Webster Electric engineers a headache by hauling out all the pump problems I've run into... and do I learn things! Those fellows really seem to enjoy giving me the answers, and I enjoy getting them. It gives me a chance to be an 'expert' the next time those problems come up. That's why you'll find me hanging around their booth, at the show. Hope I see you there."

"Old Timer"

An identical unit is made for sale in Canada by Canadian Acme Screw & Gear, Ltd. of Toronto, under license by Webster Electric Company, Racine, Wis. Established 1909.



WEBSTER ELECTRIC
RACINE • WISCONSIN

"Where Quality is a Responsibility and Fair Dealing an Obligation"

NEW LITERATURE

(Use Coupon on Page 115)

Architectural Uses of Stainless Steel . . . 222

Architectural Uses of the Stainless Steels, a new two color, 32 page illustrated booklet, was designed to familiarize architects, builders, and engineers with the rapidly growing fund of technical data on stainless steel. Booklet illustrates successful applications, shows some of the stock parts available, and features design details in ten pages of two color drawings. More than 75 photographs of stainless steel installations and stainless components are featured in the booklet.

American Iron and Steel Institute, New York, N. Y.

Humidifier Sales Helps 223

Three new pieces of literature and a counter display have been issued covering model 2300 humidifier. Included are a catalog price sheet and two envelope stuffers.

Envelope stuffer No. 458 is a detailed descriptive piece in two colors, including 23 photos covering installation, adaptability of the unit to all furnaces, dimensions, and points of construction. The second envelope stuffer, No. 469, details the need for proper humidity in all warm air heating systems and is slanted for the consumer. The dealers catalog price sheet includes descriptive copy and photos of the 2300 and lists dealer net prices for the humidifier and humidification accessories.

The counter display (Catalog No. 471) is designed to simulate a furnace plenum, and serves both as a display and as a demonstrator unit.

Viking Air Conditioning Corp., Cleveland, Ohio.

Seamless Terne Metal Roofing 224

Portfolio includes folders and mailing pieces describing seamless terne metal roofing. Roofing is made of copper-bearing steel strip, heat treated to provide the best balance between malleability and toughness. It is dip coated with terne metal, an alloy of approximately 80 per cent lead and 20 per cent tin. Weather resistance is due primarily to the lead; tin is included only because the alloy bonds more firmly to the base plate than does lead alone.

Two thicknesses of base plate are available: 1C gauge, which is approximately .0122 in. thick, and IX gauge which is approximately .0155 in.

Furnished in widths of 14 in., 20 in., 24 in., and 28 in. in 50 ft seamless rolls. For weathersealing applications such as valleys, copings, flashings, leader heads, etc., terne metal is available in widths of 4 in., 6 in., 7 in., 8 in., 10 in., and 12 in., all in 50 ft seamless rolls.

Follansbee Steel Corp., Pittsburgh, Pa.

NEW LITERATURE

(Use Coupon on Page 115)

Pocket Guide for Radiant Heat Control . 225

A new slide rule guide was designed to help heating contractors and service men determine the proper thermostatic control for radiant panel heating.

This pocket calculator, second in a series of handy guides, facilitates the job of calibrating outdoor and indoor thermostats used with the company's electronic control system for radiant heating.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Individual Contact Units 226

Bulletin M-2-D illustrates and describes a complete line of small snap-acting contact units. Lists various types of compact, sturdily constructed contact units suitable for application wherever a mechanically operated electric switch is required. Bulletin gives complete ordering specifications for both open and closed types, single and double pole types, and light and heavy duty types. Specifications include operating characteristics, electrical data, and roughing-in dimensions for all types of contact units.

Penn Electric Switch Co., Goshen, Ind.

Oil Burner Combustion Chambers 227

Circular describes lightweight refractory combustion chambers that can be adapted to fit any type installation, round, oval, or nearly rectangular. Refractory will withstand 2500 F operating temperatures. The cellular structure absorbs burner roar, insuring quiet operation, and permits fast heat-up. Chambers can be installed quickly and easily as there are only a few pieces to handle.

Folder includes complete specifications and dimensions, is illustrated with photographs of parts and complete unit.

American Clay Forming Co., Tiffin, Ohio.

Fan Catalog 228

A new 32 page fan catalog (X 6849), illustrates in color and describes in detail a complete line of fans for 1951.

Catalog gives design and construction specifications with complete performance data on the various types of desk and stand fans, air circulators, ceiling fans, kitchen ventilators, exhaust, attic, and window fans.

Copies will be mailed to those requesting it on their company stationery. Address request to

Emerson Elec. Mfg. Co., St. Louis 21, Mo.

OT* SERVICEMAN S



"Here's where I'll
get many good
suggestions..."

"That's what I look forward to... the more I learn about products, the easier my job as service man gets. For instance, by talking with Webster Electric engineers other years, I learned some of the reasons why their products save me needless call-backs and complaints. That knowledge has been putting money in my pocket and customers on my books for a good many years. It will do as much for you, if you'll specify Webster Electric products on the burners you install, and use them on all replacement jobs."

"Old Time"

Webster Electric transformers are made by Webster Electric Company, Racine, Wisconsin. Established 1909.

WEBSTER ELECTRIC
RACINE • WISCONSIN

"Where Quality is a Responsibility and Fair Dealing an Obligation"

SALES SENSE

By Jack Bedford

Selling with the S. R. O. (Standing Room Only) sign is easy . . . but shortages don't last forever as we all know. Developing other selling techniques in addition to this one will build better business and keep a salesman in condition for tough competitive selling.

\$ \$ \$

Traveling salesmen define a hotel as a place where one gives up good dollars for poor quarters.

\$ \$ \$

Salesman's Sage Says: There is no limit to the good a man can do if he doesn't care who gets the credit.

\$ \$ \$

Salesmen make a living by what they get, but they make a life by what they give.

\$ \$ \$

The first thing some people would do if they were in other people's shoes would be to get a shine.

\$ \$ \$

Salesmen who feel too important should stick their hand into a bucket of water and see what a big hole it leaves when it is pulled out.

\$ \$ \$

A good speaker, we have heard, drives home everything but his audience.

In this country every little boy, no matter how humble his circumstances, can grow up to become a taxpayer.

\$ \$ \$

Heard about the sales manager who fell in love with a night club hat check girl and decided to marry her? To be sure she was true to him he hired a private detective to get a character report on her. The detective reported:

"This lady has a fine reputation. Her past is without a blemish. She has a circle of impeccable friends. The only breath of scandal is that lately she has been running around with a sales manager of doubtful reputation."

\$ \$ \$

"Did you say your husband is fond of clinging gowns?"

"Yes, he likes to have one cling to me for five years."

\$ \$ \$

When you stop to think don't forget to start again.

\$ \$ \$

Two things are as big as the man who possesses them—neither larger nor smaller. One is a minute—the other a dollar.

\$ \$ \$

"Son," said the salesman, "It's none of your business how I met your mother, but I don't mind telling you it cured me of whistling."

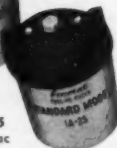
GENERAL FUEL OIL FILTERS—THE BEST for your customers . . . and for you



DELUXE MODEL 2A-300
Best for large systems or for dirty storage tanks.



MASTER MODEL 2A-700
Built for the average to large size heating system.



STANDARD MODEL 1A-25
More than adequate capacity for small homes, space, and hot water heaters.



UNDERWRITERS' LABORATORY. Re-examination Service Listing means dependability—and customer confidence.

THESE GENERAL FEATURES INSURE A CLOG-FREE FUEL SYSTEM—FEWER SERVICING WORRIES FOR YOU—GREATER SATISFACTION FOR YOUR CUSTOMERS:

1. All-wool, large-surface cartridge used in 1A-25 and 2A-700, provides fine filtration and removes moisture due to condensation. The wire-mesh strainer inside the wool felt gives double protection. No more customer dissatisfaction from shut-downs due to clogged nozzles—no more costly "call-backs" to run up your service costs.
2. Easy-to-insert cartridges that insure clean oil. Every GENERAL filter installed means regular repeat business on cartridge replacements.
3. There's a GENERAL model for every system, large or small, Gravity or Pressure burner.
4. Original unit cost is low, installation is easy, and sturdy metal construction guarantees LIFE-OF-BURNER service.

GENERAL FILTERS
INCORPORATED

CANADIAN FACTORY BRANCH: CANADIAN GENERAL FILTERS, LTD. 2679 DANFORTH AVE., TORONTO 3, ONTARIO

12890 WESTWOOD AVE.
DETROIT 23, MICHIGAN

See GENERAL'S exhibit at Booth 244, Nat'l Oil Heat Exposition, Navy Pier, Chicago, April 2-6.



IVAN is watching you

IVAN is a dyed-in-the-wool Communist. There are only 6 million party members like him in all Russia, yet these Communist brass-hats enforce the iron dictatorship of the Kremlin over 200 million Russians.

He's sold to the hilt on Red ideas. Which means he's out to get you. He believes it's either you or him . . . that the world is too small for both.

Ivan is working hard to beat you down. He has a big head start.

Right now he's got you in a bad spot.

Ivan is afraid of only one thing.

He fears your ability to out-produce him in guns, tanks, planes.

Frankly, he doesn't think you value your free system enough to do it . . . to make willingly the sacrifices he has squeezed out of the Russians.

But he's wrong!

Because you and all of us have set out

to build more and better weapons—to do it faster all the time.

We must use every bit of know-how and inventive skill we have to improve our machines and methods—to turn out more and more for every hour we work. Only in this way can we become militarily strong.

But we've got to supply essential civilian

needs as well. We can't allow needless shortages to take prices skyrocketing and lower the value of our dollar.

Sure, that means sacrifices for everybody. But doing this double job well is the only sure way to stop Ivan in his tracks—and to save the freedoms which are ours and which he has never known.

FREE . . . this important booklet tells you how our American System Grew Great



How Americans developed better machines, power and skills to build a great nation . . . Why we have been able to produce constantly more per hour . . . How this has given us the world's highest living standard.

How we can meet today's challenge—Why we must expand our productive capacity . . . supply arms and essential civilian needs, too. Read how this dynamic process works in free booklet, "The Miracle of America," endorsed by representatives of management and labor. Send for your free copy today!

MAIL THE COUPON—

The Advertising Council, Inc., 25 West 55th St., Dept. B. F. New York 19, N. Y.

Name

Address

Occupation

This advertisement, approved by representatives of management, labor and the public, is published in the national interest

AMERICAN ARTISAN



THE BETTER WE PRODUCE
THE STRONGER WE GROW



He told me, "Your competitor offered one important thing you didn't—Honeywell Controls!"

Losing a Job Was my Secret of Success!

Frankly, I was plenty worried.

I was bidding on a lot of modernization jobs—trying every idea I knew. But I just wasn't getting the contracts. And that was bad—because modernization was already a big-money market and growing bigger every week.

The turning point finally came, though—the day I lost a big job I wanted badly. That day I decided to stop guessing—and I went to the prospect and asked *why* I'd lost.

"That's simple," he said. "I liked your reasonable price, your smart planning, your company's good reputation. But your competitor offered one mighty important thing that you didn't—*Honeywell Controls throughout. I know* Honeywell products are tops—that their systems really work—that their service is the best."

Well, what he said made sense. I know, too, that Honeywell is the best. Yet I hadn't bothered to insist on getting Honeywell Controls on all my furnaces and conversion burners and air conditioning equipment.

I didn't waste *any more* time. On my very next estimate I specified Honeywell Controls across the board. And I *got* the order.

What's more, I'm getting my share—and then some—of the modernization jobs I bid on.

Believe me, I'll never install anything but *Honeywell Controls* from now on!

☆ ☆ ☆

For facts *you* need to put the Honeywell line to work for you—read the column across the page.

MINNEAPOLIS
Honeywell

First in Controls

INDUSTRY ITEMS

J. A. MacDONNELL has been appointed assistant general sales manager of Gilbert & Barker Mfg. Co. of West Springfield, Massachusetts, makers of gasoline pumps, service station and oil heating equipment, and bulk plant and refinery equipment. In his new post Mr. MacDonnell will assist Irving C. Jacobs, vice president and general sales manager, in administering the activities of the four sales divisions of the West Springfield concern. The new appointment fills the place left vacant by the recent retirement of Kenneth S. Edwards.

Mr. MacDonnell, a graduate of the Massachusetts Institute of Technology, joined Gilbarco in 1934. Assigned to the oil heating engineering staff, he served in New York, Detroit, and Chicago. In August of last year he was made assistant to the sales manager and held that post until his recent advancement.



J. A. MacDonnell



W. H. Wise

BRYANT HEATER DIVISION, Affiliated Gas Equipment Inc., recently announced the promotion of William H. Wise to assistant director of sales.

Wise joined the Bryant organization as Chicago branch manager in 1947 after serving as manager of the Sales Engineering Department for Peoples Gas Company of Chicago. In early 1950 he became Bryant's mid-western sales manager in which capacity he served until his latest appointment.

L. A. DEER HEATING CO., one of the largest sheet metal contractors in the Binghamton, N. Y., area, has completed expansion and remodeling of its headquarters on the George F. Highway in Endwell, N. Y.

A complete, modern sheet metal shop capable of nearly any type of sheet metal fabricating, has been established in the expanded shop. Display, office, and warehouse area also has been augmented.

In addition to its facilities on the George F. Highway, the company maintains an office and showroom at 26 Seminary Ave., Binghamton, and a warehouse on Binghamton's north side.

L. A. Deer, owner of the firm, said: "To insure delivery and guarantee against delays, we are carrying a large stock of all types and sizes of heating plants. We also have considerable supplies of necessary repair parts on hand."

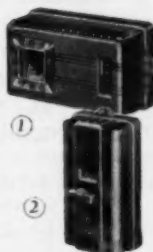


Greater familiarity with Honeywell products will help you get more modernization jobs. So be sure you know these

Facts it pays to know!

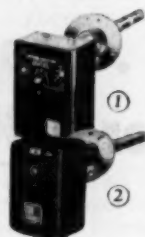
Honeywell Thermostats

1) The new Chronotherms are the most sensitive, most accurate thermostats ever built! They automatically lower the temperature at night, automatically raise it in the morning. Standard model illustrated. 2) Honeywell's Time-O-Stat is distinguished from ordinary thermostats by "Day-Nite" control which provides automatic morning pickup. With this thermostat your customers can turn off the furnace without making a trip to the basement. The famous Acratherm (not shown). Dollar for dollar, it's hard to beat this thermostat for fine temperature control. Simple to calibrate, set and adjust.



Limit Controls

1) The LA401 Combination Furnace Control has an extremely rapid rate of response, is highly sensitive. A linkage stop makes it impossible to adjust fan-on setting above limit control. 2) LA219 Airstat gives the finest kind of high limit protection. Adjustable or fixed differential. Adjustable or fixed stops to limit maximum high temperature setting. Plainly visible scale. LA412 Furnacestat (not shown) is a popular fan controller that prevents cold air circulation in winter. During the summer it can be set for cooling. Mercury switch. Easy-to-read scale.



Relays and Valves

1) The RA117 Protectorelay is designed for fast, reliable operation at low stack temperatures. Can be mounted at an angle. Ignition failure trips a switch that shuts down burner. Recycles on flame or power failure. 2) The compact V898 Diaphragm Gas Valve is a low-cost valve that's especially useful for conversions and for installation on existing burners. Comes with either mounted or plug-in transformer. Quiet in operation. Slow opening. Standard width.



MINNEAPOLIS Honeywell

Minneapolis-Honeywell Regulator Company
Minneapolis 3, Minnesota

royal jet-flow

safe with children

Hot air grilles are located just below ceiling level...children cannot get burned on hot grilles, nor can furniture be ruined or scorched.

These extra safety factors are just one of the many outstanding features that make the Royal Jet-Flow America's outstanding heating unit.

Write to Royal Heaters, Inc.,
Alhambra, California,
for complete information.



... casings designed exclusively for YOUR FURNACE

by *Atlas*

Even the finest furnaces need attractive, well-designed casings. Customers want furnaces with both performance and beauty. Dealers want labor-saving, cost-saving casings which are quickly assembled without bolts or screws. Atlas casings please both dealers and customers. Built to combine the demands of your furnace models and the desires of your market, Atlas casings are yours exclusively, with your name, trademark or other identifying features.

Send your furnace specifications for cost estimates to:

***Atlas* MANUFACTURING
COMPANY**

**EUSTIS AT ROBBINS STREET
ST. PAUL 4, MINNESOTA**



CLAUDE STOUT, president of the Marshall Furnace Co., Marshall, Michigan, died on January 28th, 1951, at the age of 71.

Mr. Stout began his career with the Marshall Furnace company 50 years ago. He was well-known in the warm air heating industry as a capable engineer.

WILLIAM J. MEYER, 65, long a sheet metal and roof contractor in Rochester, N. Y., died in Washington, D.C., Feb. 3 while on a trip to Florida.

A roofing contractor for 30 years, he was the owner of the William J. Meyer Company, Inc., 103 Griffith St. He was a member of the Rochester Club, the Chamber of Commerce and the Rochester Builders Exchange.

Surviving are his wife, Gertrude; a daughter, Mrs. Raymond J. Schlegel; a son, William J. Jr.

DAVID E. SEDGWICK, formerly secretary and sales manager, has been named vice president in charge of sales and advertising for the Waterman-Waterbury Company. Other officers named were Harry G. Cross, president, and Ben O. Schwarz, secretary and treasurer.



D. E. Sedgwick



R. Edelen

RICHARD EDELEN has recently been appointed manager of the southeastern region for the Delco Appliance Division, General Motors corp., according to an announcement by General Sales Manager Andrew C. Freimann. He will make his headquarters in Atlanta, Georgia, and will supervise the sales of Delco-Heat products and Delco Water Systems in an eight-state area.

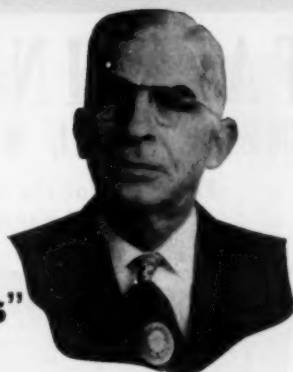
Mr. Edelen was born in Brooklyn, Iowa, and is a graduate of Iowa State University in the class of 1946. He has also done graduate work at Northwestern University.

He joined Delco Appliance Division in August, 1948, as a member of its market research section. In April, 1950, he became a member of the Delco Appliance sales force and has been stationed in Atlanta since that time.

ONE OF THE FIRMS exhibiting at the recent International Heating and Ventilating Exposition in Philadelphia was the United States Steel Supply Co., Newark, N. J.

On display for the sheet metal trade were a new shear which cuts circles and shapes and also does forming, flanging, and beading. The Alhart pattern developer was also featured. Two low-cost tools for forming S clips and drive cleats were on display in the booths.

"Rochester Gauges Mean Satisfied Customers"



"We've been in this business long enough to know that flimsy oil tank gauges are bound to cause trouble. That's a headache we avoid by using Rochester "Dual-Dial" Gauges exclusively. Their dependability means satisfied customers and that means more business and fewer service calls for us."

Jay J. Walsh

JAY J. WALSH, INC.
ROCHESTER, N. Y.



Like hundreds of other dealers, Jay J. Walsh has found that the dependability and positive leak-proof feature of Rochester "Dual-Dial" Gauges pay off in years of trouble-free service. They cannot leak oil or vent fumes into the basement, even under pressure. Costly service calls are reduced to a minimum. And the easy-to-read "Dual-Dial" can be seen from both front and back—makes checking and filling of tanks a snap.

Rochester "Dual-Dial" Gauges have been Underwriters' listed for over 25 years. Leading wholesalers everywhere stock them for basement fuel oil tanks in the following depths—22", 24", 26", 27", 42", 44" and 47"; 1½" and 2" pipe thread connections. Special lengths to order. Stock up today. ROCHESTER MANUFACTURING CO., INC., 66 Rockwood St., Rochester, N. Y.

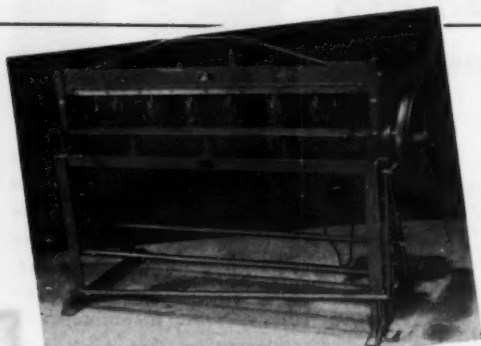
SEE US AT THE
NATIONAL OIL HEAT EXPOSITION
BOOTH 450

ROCHESTER
MANUFACTURING COMPANY, INC.
DIAL THERMOMETERS GAUGES AMMETERS



FALLSINGTON SHEET METAL MACHINERY

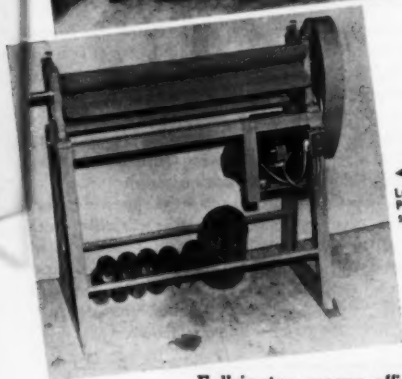
*Designed for the Practical
Sheet Metal Man*



▲ Above: Fallington Power Driven Multi-Notcher. Available either power-driven or hand operated.



◀◀◀ Left: HX 36 Husky Press.

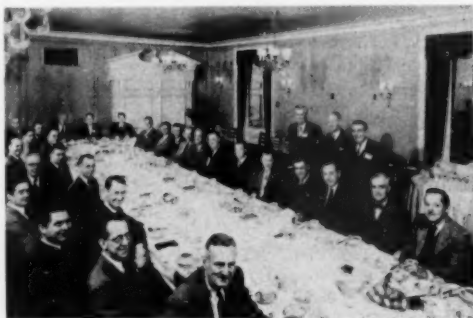


◀◀◀ Left: PR 36 Roller. Power Driven is described below.

Fallington means efficiency! Illustrated above are just three of the units which will put your shop on a real production line basis. On the Multi-Notcher dies are available for V-notches, Pittsburgh notches, and punching holes. Minimum distance between centers is $2\frac{3}{4}$ ". The Husky press is available in two models, H24" and H36". Bed area is 8" x length of machine. Roller PR 36 rolls smoke pipe or ducts from 3" to 8" without crushing lock on smoke pipe. Lock is first made on the Husky Press. Please write us for more information.

FALLSINGTON MFG. CO., Fallsington, Pa.

VAN-PACKER CORP., Chicago, held a sales luncheon at the National Home Builders Show to celebrate another year of sales growth. Representatives of C. A. McRobert & Son, Ltd., Canadian affiliate were present. Van-Packer now has factories at Buda and Carbon Cliff, Illinois.



Van-Packer Meeting

Van-Packer Eastern Corp. headquarters is in Newark, New Jersey and Industrial Van-Packer Corp. is located at Davenport, Iowa.

THREE NEW REGIONAL sales managers have been appointed by Servel, Inc., according to an announcement by John K. Knighton, general sales manager of the company.

Paul R. Kennedy, formerly of Cleveland, Ohio, has been named regional sales manager with headquarters in Chicago. The others are Austin J. Schullstrom, with headquarters in Evansville, and Conan J. Doyle, who will make his headquarters in the Servel office in Washington, D.C.

Mr. Kennedy, a native of Ashtabula, Ohio, at one time was associate director of the Federal Housing Administration in Cleveland and Columbus. Before his promotion he was a district sales manager with headquarters in Los Angeles for Servel.

In his Chicago position, he succeeds A. F. Lee, former regional manager, who has been appointed national utility sales development manager with headquarters in Servel's home office at Evansville.

Mr. Schullstrom formerly was a district sales manager in St. Louis, joining Servel in 1935.

Mr. Doyle formerly was assistant regional manager for Servel in Washington. He succeeds Roderic Peters, who has been appointed national industry and government sales relations manager for the firm in Washington.

ARTHUR W. WRIEDEN, manager of the Syracuse, New York, plant of Lennox Furnace Co., Inc., for the past 10 years, and previously sales manager for about 5 years, has announced his retirement.

He will be succeeded as plant manager by Harold G. Krayenhof, who has been sales manager for a number of years. Robert Pierce is to be the new sales manager.

HERE'S WHY...

You'll be money ahead purchasing

HARDWARE

all from **one** source

simplified purchasing • complete selection
lower shipping costs • simplified control
uniform high quality • prompt delivery

Ask about our
complete line of...

**HANDLES
CATCHES
HINGES
SCREWS and BOLTS**

suitable for use on...

- SPACE HEATING UNITS
- AIR CONDITIONING EQUIPMENT
- OIL BURNERS
- STOKERS
- GAS HEATING UNITS
- HUMIDIFIERS



WRITE US FOR FULL INFORMATION

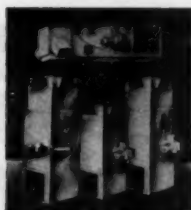
NATIONAL LOCK COMPANY

ROCKFORD • ILLINOIS

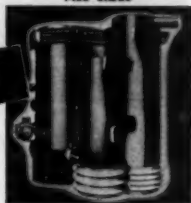
New
**HEATING
OPPORTUNITIES
FOR You!**

THERMOBLOC

self-contained,
direct-fired unit for industrial plants, large buildings.



ALL SIZES



FOR ALL PLANTS

SELLS ITSELF... NO INVESTMENT NEEDED!

Here's new business to offset any decline in home construction or domestic heating installations. Demand for THERMOBLOC is growing rapidly. It will open new fields for you in heating for industrial plants and other buildings with large open interiors. Each installation pays you big money, without investment by you.

THOUSANDS OF PROSPECTS

Prospective buyers are everywhere—large industrial plants—garages—service stations—warehouses—bus terminals—bowling alleys—auto repair shops—skating rinks—wherever large buildings with unpartitioned areas need heating.

NO NEED TO STOCK UNITS

All you need to sell THERMOBLOC is a supply of sales literature and order forms to book orders. We supply those. You don't have to carry any units in stock. We ship all units from the factory.

EASY INSTALLATION... NO ENGINEERING

Installations are easy and fast. There's no engineering to do. Units come completely assembled or in simple sections, and all you need do is fit them together and hook up to fuel supply and power line.

BIG EARNINGS EVERY SALE

You make big earnings every sale, more than you make on most unit installations or appliances. And it's practically all profit. About all you invest is your time.

GET ALL THE FACTS... SEND THE COUPON BELOW

THERMOBLOC DIVISION

PRAT-DANIEL CORPORATION

3-6 MEADOW STREET

SOUTH NORWALK, CONNECTICUT

Manufacturers of P-D Power Equipment

PRAT-DANIEL CORPORATION

Thermobloc Division

3-6 Meadow Street, South Norwalk, Conn.

Gentlemen:

I am interested in taking on a dealership for THERMOBLOC. Please send complete information.

NAME _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

Only RANDALL PILLOW BLOCKS

ARE DOUBLE
LUBRICATED
GIVE DOUBLE
PROTECTION



Yes, only with Randall Pillow Blocks are you doubly protected and doubly certain of longer, quieter, bearing performance. The machined grooves in the precision bronze bushings of Randall pillow blocks are filled with lubricating graphite. This plus oil fed through the graphite by capillary action from the wool felt packed oil reservoir gives double lubrication over the entire surface of the bearing. This and many other outstanding Randall features are backed by more than 40 years of bearing application experience. Start getting this double protection at no extra cost today. Write for catalog No. 103 which lists all sizes and styles available, installation and other specification data. Remember, there's a Randall for every type application.

Test tube shows the comparatively enormous amount of oil held by extra large reservoir of Randall pillow blocks. Standard 1" Randall pillow block holds 18 cubic centimeters of oil. This assures proper oiling over longer period with less frequent oilings.



BRONZE BAR STOCK
BRONZE BUSHINGS
PILLOW BLOCKS
SHEET LUBRICATOR

Randall

GRAPHITED BEARINGS
THRUST WASHERS
BABBITT METALS
SAFETY COLLARS

RANDALL GRAPHITE BEARINGS, INC.

1000 S. GREENLAWN AVE.

LIMA, OHIO

moving to Syracuse from Boston, Mass., where he has been assistant sales manager for the New England division of Lennox Furnace.

Mr. Wrieden explained that he proposes to relinquish all active business responsibilities and will devote a considerable portion of his time to travel. However, he will continue to be associated with Lennox Furnace in an advisory capacity.

CONTROLLING INTEREST of the Cincinnati Elbow Co., 2021 Eastern Ave., Cincinnati, Ohio, manufacturers of conductor pipe elbows, was purchased by Oliver L. Bardes, president of the Bardes Forge and Foundry Co., from J. Richard Roe, it is announced by Lee Gillespie, newly elected president.

Mr. Gillespie has been vice president and general sales manager of the Cincinnati Elbow Co. since the company's organization, and was formerly associated with the Armco Steel Co. Mr. Roe is no longer connected with the company.

GEORGE J. READ, vice president of Chelsea Fan and Blower Co., Plainfield, New Jersey announces the appointment of T. B. Allen as midwestern representative for the complete line of industrial, commercial, and residential fans. Mr. Allen will continue to make his headquarters at 3918 Beard Ave. South, in Minneapolis.



T. B. Allen



W. E. Pflieger

THE APPOINTMENT of W. E. Pflieger to the newly created position of special representative of the Williams Oil-O-Matic Dealer Retail Activity Department was recently announced by E. H. Davison, general sales manager of the Williams Division, Eureka Williams Corp.

Mr. Pflieger previously was New York metropolitan area field sales representative for Oil-O-Matic.

He will counsel dealers on merchandising campaigns, advertising and promotion plans, market analysis, hiring and training of salesmen, and the establishment of sales quotas.

Mr. Pflieger's territory will include the New England states and the Eastern Seaboard.

His appointment is one of the first moves in expansion plans for Oil-O-Matic's dealer retail activity program. Other appointments in the program will be announced later.

H. H. Hurston, who had been field sales representative for central Illinois, takes over Mr. Pflieger's former post.

GOOD REASONS WHY...



SNO-BREZE AIR COOLERS



... are preferred EVERYWHERE!

Forty-two years of air-conditioning know-how back every Sno-Breze—a perennial leader.

Sno-Breze is field performance tested for complete customer satisfaction—a worthy favorite of architects, engineers, and builders.

and now

Sno-Breze has been awarded the Good Housekeeping Seal of Approval and Guarantee—the buying guide of millions for securing the best product value—a climaxing vote of confidence for America's No. 1 cooler—Sno-Breze.

Note: The tremendous, ever-increasing demand for Sno-Breze through our established outlets limits new franchises to certain markets. You may be located in one of these areas. SO WRITE TODAY for further information on this lucrative line.

PALMER MANUFACTURING CORPORATION
DEPT. A-2

Phoenix • Los Angeles • Lubbock & Dallas, Texas

FOLLOW THE PATHWAY TO PROFITS *with*

WALSH REFRACTORIES FOR THE DOMESTIC HEATING INDUSTRY



COMBUSTION CHAMBERS

Walsh-Made PeTeCo Precast Interlocking Combustion Chambers assure complete burning of oil... full efficiency.

Greater profits on each installation... bigger fuel savings for your customers... are the extras you get in Walsh products for the domestic heating industry. On every count... from unexcelled manufacturing facilities to long experience, careful selection of raw materials and modern production methods, Walsh-made products assure you and your customers of unvarying high quality and dependability.



BAFFLES

Tripod type precast baffles with burnt refractory legs. Saves fuel. Reduces stock temperatures.



WALSH H & B CASTABLE

Money, time and labor saving "mix-and-pour" refractory. In 50 lb. and 100 lb. moisture-proof bags.

WALSH PRODUCTS INCLUDE:

Fire Brick • Furnace Liners • Burnt Combustion Chamber Tile
Plastic Furnace Lining • Castables • Airsetting Cements
Asbestos Furnace Cement • Insulating Fire Brick and Cement
Insulating Cement Fill

WALSH REFRACTORIES CORPORATION

101 Ferry Street • St. Louis 7, Missouri

FACTORIES: ST. LOUIS, MO. AND VANDALIA, MO.

WALSH
REFRACTORIES CORPORATION
ST. LOUIS, MISSOURI U.S.A.

TOPS!



THARCO—a secret formula Armstrong product . . . unduplicated, unmatched for ease of application and long-lasting, trouble-free results.



of Leading Contractors
and Manufacturers

New Color Now Available

OTHER ARMSTRONG PRODUCTS

"33" Compound
for wood or
metal sash glazing

Steel Sash
Putties

Wood Sash
Putties

Rely-on Caulking
Compound



TRADE MARK
OF
EXCEPTIONAL
QUALITY

THE ARMSTRONG COMPANY

241 So. Fair St.
Detroit 17

4053 So. Lillie St.
Chicago 9

2411 Swiss Ave.
Dallas 7

Richmond
California

THARCO Asbestos Furnace Cement now comes in two colors: Black and Light Gray.

Many furnace men prefer this new Light Gray THARCO. They report it a cleaner furnace cement to handle, and that it makes for a neater finished job.

Both colors are packaged in sizes to meet all requirements—from one-pound cans to 350-pound drums. Your jobber can supply you promptly.

FREE Sample of either color THARCO is yours for the asking. Write us at Detroit for it today.

HYMAN BLAUSHILD, president of the Famous Furnace Co. announces the opening of the Famous Furnace Co. of Akron, Ohio located at 167 Hill St., on January 6th 1951.

Open house was held at the Akron address and approximately 600 guests including many suppliers were entertained in the new warehouse.

The Famous Furnace Co. of Akron will be under the management of Arthur A. Solomon who is the former representative in the area of the Famous Furnace Co., Cleveland, Ohio.

GEORGE M. HASE has just been appointed as sales representative for the L. J. Mueller Furnace Co. and has been assigned to the northern sales district, it was announced recently. His territory will include the states of North Dakota, South Dakota, Minnesota and the northern portions of Wisconsin and Michigan. Mr. Hase will work under the supervision of Harry B. McKee, Mueller northern district sales manager.

Mr. Hase has been with Mueller since 1948. He joined the company as an engineer and spent over a year in the design and engineering divisions of the company's engineering department.



Hase



Davidson

WALTER L. DAVIDSON has been named sales manager for the heating department of Dravo Corp., Pittsburgh, the company has announced.

Mr. Davidson has been with Dravo since 1942 in various positions in the engineering works and machinery divisions.

In his new post he will supervise the national sales organization for Dravo Counterflo direct-fired warm air space heaters. His headquarters will be in the Dravo Building, Pittsburgh.

Mr. Davidson attended Carnegie Institute of Technology and the University of Pittsburgh.

MERVIN A. SCHAEFER, who for the past two years has been sales representative for Payne Furnaces in the northern California territory, has been appointed Payne sales representative for the states of Oregon, Washington, and Idaho, according to announcement by C. F. Cushing, director of sales.

Mr. Schaefer has had many years' experience in the heating business. Prior to joining Payne, he was connected with Coast Counties Gas and Electric Co.

Robert C. North succeeds Mr. Schaefer as Payne sales

THIS YEAR AND EVERY YEAR...

REX

THE LINE
THAT'S FINE
ALL THE
TIME



**ALL-PURPOSE
BLOWER**

Portable. Low price. Washable filters. Quick installation. No grouting or cold air returns. Summer-winter operation.



PORTABLE FANS

Three models for circulating and ventilating purposes. Used in windows, on walls or floors.



ATTIC FANS

Four models horizontal mounted, vertical discharge type. Large capacities. With ceiling shutters.



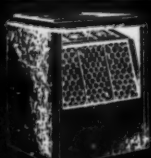
DIV. CLEVELAND HEATER CO.
2310 SUPERIOR AVENUE
CLEVELAND 14, OHIO

SOLD THROUGH DEALERS AND JOBBERS ONLY



BLOWERS

Over a dozen models for standard applications. Able to make special units to meet manufacturers specifications.



**BLOWER-FILTER
UNITS**

Nine models. 700 to 6500 C.F.M. For all gravity warm air furnaces. Latest engineering developments.



WINDOW FAN

Reversible ventilating fan for 4 to 6 rooms. Large capacity. Fits most windows. Easy to install.



VARIABLE-USE FAN

Ten models with unlimited application for domestic, commercial and industrial use.

WRITE TODAY

Catalog or Specifications. If you're a manufacturer with Blower problems call us in.

"mighty mite"

OF CONVERSION GAS BURNERS



All the design features of the famous standard Lo-BLAST Power Gas Burner in a compact, residential size unit.

LO-BLAST ECONOMITE

Averages 10% less in fuel consumption
•easy to install •safe in operation •no "pop"
at start and stop •easy to service •long-lived.
Capacities from 75,000 to 300,000 BTU.

Economite power burner design means perfect combustion—fuel saved. It assures quiet operation, no combustion roar. Shipped to you completely assembled—equipped with every device for safe operation—factory tested on gas.

All parts are accessible—there's nothing in the fire box but the fire. Simplicity of design and durable construction. cuts service to a bare minimum.

When you see an Economite, you'll realize that here, indeed, is an utterly different and better gas burner.

DEALERS!

Write today for full information on this outstanding gas burner. Nothing like it on the market—a sure profit maker!

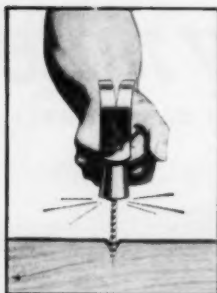


**STANDARD
LO-BLAST BURNER**

Approved by leading utility companies and consulting engineers. Capacities to 20,000,000 BTU.

**MID-CONTINENT
METAL PRODUCTS CO.**

1960 N. Clybourn Ave., Chicago 14, Ill.



in to
stay
when
you use



Hardened SCREWNAILS

for fastening sheet metal to wood



• You drive it in like a nail, and as it spirals into the wood, it holds like a screw.

• P-K Screwnails are hardened. They won't bend or break, and, driven home, they won't work loose, or back out, even under the toughest vibration, expansion and contraction. Be cause each one makes a stronger fastening, fewer Screwnails need to be used on most jobs.

• The hard, needle point pierces lighter gauges of sheet metal with ease. For heavier sheets, holes can be punched first with a Screwnail Punch.

• Try P-K Screwnails, next time, for a better, faster, stronger job . . . and remember . . . IF IT'S P-K, IT'S O.K. Sold everywhere through accredited Distributors.

PARKER-KALON*

FASTENING DEVICES

Makers Of The Original Self-Tapping Screws



Write for this folder

Gives sizes, head styles, Punch information, full instructions for use. Tells you the many ways Screwnails will help you do a better job. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

*TRADE MARKS REG. U.S. PAT. OFF.

representative in northern California. He has been sales representative for Payne in the territory comprising West Texas, New Mexico, and Arizona. Previously, he was manager of the retail branch formerly operated by Payne at Long Beach, Calif.

DUANE W. ROUSE has been appointed service manager to Toridheet Division, Cleveland Steel Products Corp., according to an announcement recently made by R. J. Lucas, general manager of Toridheet.



D. W. Rouse

A member of the Old Timers Club of the Oil Burner Industry, Mr. Rouse first joined Toridheet in 1932. After serving successively in the engineering department, development laboratory and service department, Mr. Rouse temporarily left the heating field during World War II. He returned to Toridheet in 1947 in the capacity of service engineer.

Mr. Rouse has been conducting Toridheet service and installation training programs in recent years.

SIX GRADUATE ENGINEERS have completed a six-month training program under the auspices of Airtemp Division, Chrysler Corp., Dayton, Ohio. They have all been appointed field engineers, according to Chester S. Stackpole, vice president and sales manager.

Their names and assigned regions are: Robert S. Ambrose, Dallas; Ole A. Christensen, Dayton; R. L. King, Chicago; R. J. Link, Philadelphia; P. R. Lint, Washington, D. C.; and W. F. Walter, Atlanta.

Editorial—

(From page 58)

Assistance given by prime contractors. The type and amount of technical and managerial assistance which prime contractors give to their subcontractors varies. In some instances, a prime contractor will give extensive assistance to a small subcontractor, particularly if he is anxious to do business with him. In other instances, the prime contractor will furnish the subcontractor only with drawings and specifications for the work to be done.

Undoubtedly, as the defense effort grows, and with it the demand for subcontractors, large companies will be willing to provide their subcontractors with an increasing amount and variety of assistance.

Based on the practices of certain companies today and on practices employed during World War II, some of the types of assistance which might be offered to you by a prime contractor are: the furnishing of special tools needed for the subcontracting work, or assistance in designing such tools; the

Compare the Value



Clipper

FORCED AIR GAS HEATING

The Henderson Clipper, Clipperette and new Hendy "60" offer a complete range in B.t.u. input, from 60,000 to 200,000. Each model challenges comparison in design, materials, construction, performance and price! Investigate before you specify.



PRECISION CONSTRUCTION—Custom standards of craftsmanship combined with modern assembly-line production. Even the panels are fitted to a tolerance of 1/64th inch!

HENDERSON BLOWERS—Our own design, produced complete in our own factory, painstakingly balanced for smooth, quiet operation! No others like them.



FACTORY TESTING—Every unit is completely assembled at the factory and tested in actual operation. Saves time, saves trouble on the job.

Write for "Compare the Value" booklet

HENDERSON

FURNACE AND MFG. CO., SEBASTOPOL, CALIF.

CLIPPER • CLIPPERETTE • HENDY "60"

FOR PROFITABLE AND EASY WEATHERSEALING



Every house needs weathersealing and every flashing, coping, conductor in modern housing is another opportunity for you to make a nice profit by installing Follansbee Seamless Terne Metal.

Don't overlook these profitable weathersealing jobs on new construction and on repair contracts. Time-proved Follansbee Terne Metal is easy to handle and apply—its well-known durability assures customer acceptance.

Industrial and commercial buildings need weathersealing, too. When you make your regular check-up on roof maintenance contracts be sure to show samples of Follansbee Terne Metal to architects and engineers. Tell them about the trouble-free Follansbee Terne Roofs in service fifty years or more. That's the direct route to profitable weathersealing and roofing contracts.



Drop us a note and we'll tell you who handles Follansbee Terne Metal in your territory.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP • SEAMLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. Plants—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES

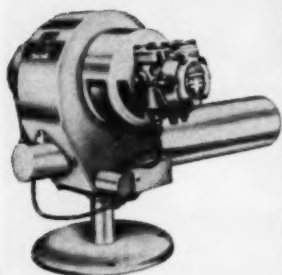
Pittsburgh, Pa.

Rochester, N.Y.

Fairfield, Conn.



Get Ready for 1951 with the Big Profit Line of Better Oil Burners



It pays to sell the Sun-Ray because it's a quality line, built by one of the leading and oldest burner manufacturers. Sun-Ray burners are endorsed and specified by architects, engineers, builders, realty managers, federal, state and city departments everywhere. Thousands upon thousands of these burners are installed every year in homes, apartment houses, stores, factories, schools, churches, institutions, etc.

It pays to sell Sun-Ray because Sun-Ray sales literature, newspaper mats, window displays and signs make Sun-Ray known to your customers as an outstanding name for economical heating. Sun-Ray factory engineering and sales cooperation are outstanding.

For quicker service—Sun-Ray Burners are factory stocked in Buffalo, Chicago, St. Louis, Detroit and Portland, Ore. They are also warehoused by leading distributors throughout the country.

Investigate the Sun-Ray line from every angle—design, specifications, installation, service, performance, price. You'll discover—as have many others—that it pays off handsomely to enjoy a Sun-Ray sales franchise.

Inquiries invited from furnace and boiler manufacturers.



**Famous the World Over
for Quality and Economy**

Be sure to visit our interesting exhibit,
Booths 424-6 at the National Oil Heat
Exposition, Chicago, Ill., April 2-6.

SUN-RAY BURNER MFG. CORP.

139-34 Queens Boulevard

Jamaica 2, N. Y.

Models from
0.7 to 25 g.p.h.



furnishing of special jigs, fixtures and gauges, advice or assistance in changing your plant layout, if this is found necessary; assistance in obtaining needed scarce equipment, thus avoiding possible long delays, and help in improving your inspection, production control, and cost methods.

Progress payments and Government loans.

Shortage of working capital does not automatically rule out the possibility of handling subcontracts. If a prime contractor believes that your plant can turn out work of excellent quality, he may be willing to give you a subcontract and make partial payments to you as the work progresses, thus enabling you to carry out the contract.

Or, if you are awarded subcontracts for one or more defense orders, and your local bank is unwilling to take the entire risk of financing them, you may be able to obtain a guaranteed V-loan under Regulation V of the Federal Reserve Board. There is no fixed limit on the amount of a V-loan, which can be used to buy raw materials, to pay wages, to pay rent and interest, and, to a limited extent, to buy machinery and equipment. The loan cannot be used, however, to expand or build plants.

An application for a V-loan can be made through your local bank to the Federal Reserve Bank for your district.

Loans for expanding plant capacity, developing manufacturing processes, or producing essential materials are available from the government under terms of the Defense Production Act of 1950. Such loans will be made only if their use will speed production and deliveries or services to aid in carrying out defense contracts, and only if loans for the purpose are not available from private financial sources, with or without government guarantee, or from other public sources on reasonable terms. The Department of Commerce is the certifying agency for most industry loans. Applications can be filed with the Department in Washington or with Departmental Field Offices.

If the loan application is approved, the Reconstruction Finance Corporation will act as agent for making the Loan.

Kruckman—

(From page 68)

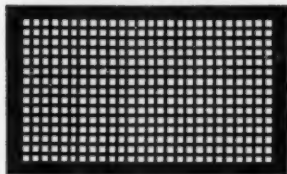
ance for loans on military housing would be available for two years from July 1, 1951.

The existing law would be amended to permit low rent public housing, now receiving government aid, to be used for defense purposes as the need might occur. The law would be amended to make FHA insurance yields or direct investment in low rental housing more workable in connection with the defense program. Congress would supply the funds necessary to finance

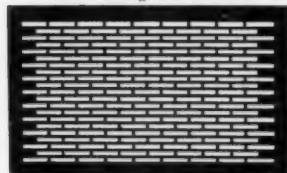
For Every Requirement

A-J offers a complete line for the largest to the smallest jobs—you can install them with full assurance of the best possible quality and performance. A-J Registers and Grilles are made to last and designed to harmonize perfectly with any architectural styling.

The A-J Line will be a valuable adjunct to your planning programs. Write us for more complete details.



#1



#2

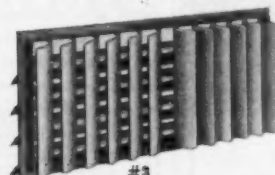
Here are several illustrations to help show the variety of the A-J line.

#1—Plain Lattice Design with 53% area. Especially popular for ventilating systems.

#2—Slotted Design—73 to 75% free area. Particularly suited to tasteful architectural motifs.

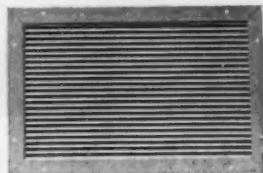
#3—Double Diffusers. Ideal for jobs where large volumes of air must be controlled. Also available as single diffusers where horizontal deflection is not required.

#4—700 Series No-Vision Door and Partition Grilles. Available with channel or flange frame. The 700 A-B grilles offer maximum free area yet are completely light proof.



#3

Defense Orders
Will Get
Special Priority
On
Delivery



#4

Jobbers and Dealers—Send for Catalog

A-J MANUFACTURING CO.

2119 Washington St.

Kansas City 8, Mo.



- Precision-made by skilled artisans
- Saves labor on the job
- Packed and shipped in convenient cartons
- Carried in stock by leading wholesalers

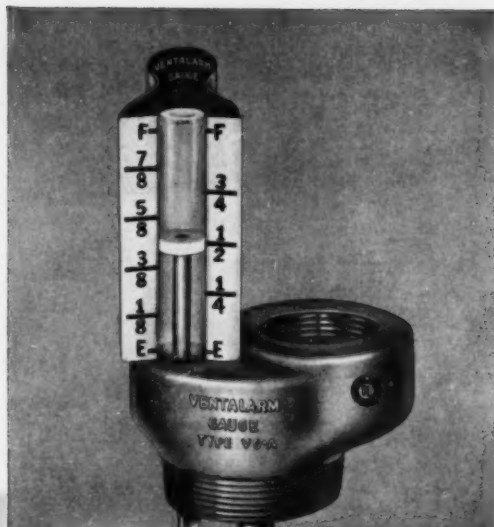
For top quality, snug fit, and ease in handling — use Ohio Valley furnace products. Ducts, pipes, and fittings are easy to install, and are conveniently packed in cartons which are clearly marked as to quantity and size. To save time on every installation, do the job with Ohio Valley furnace pipes, ducts, and fittings.



Ohio Valley Hardware & Roofing Company

Metal Manufacturing Division

Evansville 2, Indiana



SINGLE UNIT provides
Automatic Fuel Oil Delivery
Easy Check on Tank Contents
Scully VENTALARM® GAUGE

Combines Whistling Tank Fill Signal with super-visible tank gauge in one labor-saving unit.

AUDIBLE WHISTLE SIGNAL makes fuel delivery automatic for the customer. Oil Man simply goes direct to fill pipe and just fills 'til the whistle stops. Allows day or night delivery without entering the home.

SUPER-VISIBLE TANK GAUGE includes white button indicator inside leak-proof plastic tubing. Easily read by the whole family, even 10 feet away. Flexible float arm. Oil resistant cork float.

Installed directly on the fuel oil tank as an integral part of the vent pipe. No reducing bushing needed, so you install one item instead of three. Can be installed in partly filled tank.

Available for 275 gal. cellar tanks with depths of 24", 26", 27", 42", 44" and 47". Specify tank depth and tank opening when ordering from your regular Supply House.

Sizes: VG-A, 2" x 1 1/4"
 VG-B, 1 1/2" x 1 1/4"

Approved by Underwriters' Laboratories, Inc.

SCULLY SIGNAL COMPANY
 72 First Street, Cambridge 41, Mass.
 Canadian Licensee: EMPIRE BRASS MFG. CO., LTD.
 London, Ontario

SEE US AT THE OHI SHOW — BOOTH #314

TRADE PRICE

\$2.95

Complete
 (Subject to change
 without notice)

community facilities and their maintenance, if not otherwise available.

Overall administration and responsibility for the housing program would be placed with the Housing and Home Finance Agency, subject to determination by the President as to particular requirements of other agencies, including functions relating to community facilities and services. At the local level, the program would be based primarily on private enterprise for housing construction, and for the provision and operation of incidental services, with direct government financing only on proof of need. Payments in lieu of taxes are authorized for local and state taxing authorities to cover Federally owned housing and community services and facilities.

So far as possible, Federal financing would be limited to one to four family permanent structures — with permission for multi-family projects — to be sold to occupants and veterans when defense needs permit. Temporary housing needs would be met by structures that can be moved from the site and reused in other localities. In defense areas rentals could be controlled and preferences in tenants provided. The two, three and four bedroom houses would be valued at \$9,000, \$10,000 and \$11,000. Making due allowance for maintenance, upkeep, taxes, water charges, etc., the rent on these houses will run somewhere between \$70 to \$93 a month. For units in multi-family structures the rents are expected to run from \$77 in the case of row house projects, to \$89 in the case of walk-up apartments, when the units of two or more bedrooms are valued at \$9,000. Administrator Raymond M. Foley of HHFA stresses that the rents and valuations are absolute maxima, and that lower figures would certainly prevail in many localities.

Literally no one knows when defense housing legislation will be enacted. The House has held its hearings and is almost ready to report. The Senate has held protracted hearings, and it is expected to continue its hearings indefinitely. It is anticipated the Senators on the senate banking committee in the months ahead will roam all over the United States to study the defense housing problems. They will send out experts to make special investigations. There is a reluctance to enact the bill because the National Association of Home Builders, the real estate boards, and other industrial trade organizations representing builders, contractors, and those engaged in allied industries, have vigorously opposed the proposed law. They maintain that private enterprise can do the job just as well, if the emphasis is not mainly on rental, and if the restrictions on construction imposed by the National Production Authority are removed. These organizations maintain a large and effective lobby in Washington. There is no doubt it is their influence which arrests the action of the Senate.

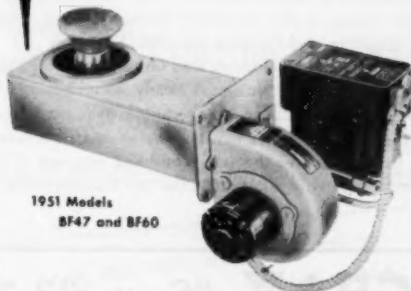
Senator Maybank, author of the Senate bill, and chairman of the senate banking committee — not very well at the moment — opposes that part of the bill which would make the \$3 billion cover the non-defense housing as well as the defense housing. He wishes HHFA to apply

**MORE FURNACE
MANUFACTURERS
THAN EVER BEFORE
WILL CHOOSE**



**The New 1951
Ball Flame
OIL BURNER**

Reg. U. S. Patent Office



1951 Models
BF47 and BF60

In 1951 manufacturers will again show their overwhelming confidence in the quality and performance of "Ball Flame" Burners by making them a vital part of the furnaces they will ship to small homes projects and to builders of hundreds of individual homes.

This completely automatic, pressurized air, gravity type oil burner is now standard for leading makes of small furnaces, installed in many flourishing home developments.

Builders and heating contractors in large numbers are writing the "Ball Flame" into their furnace specifications.

Here's Why

- ✓ It's absolutely quiet—no motor hum, no flame roar.
- ✓ It burns less than 0.75 gallon per hour without clogging, flame deflection and burning out of fire boxes, as with small capacity pressure burners.
- ✓ It vaporizes and burns the oil perfectly — no starving the center of burner flame and poor combustion.
- ✓ An automatic levelling device is built into each burner.

KRESNO-STAMM MFG. CO. (America) Inc.

PALISADES PARK, N. J.

Canadian Affiliate: Kresno-Stamm Mfg. Co. (Canada) Ltd.
1452 Drummond Street • Montreal, P. Q.

**Keep Your Service Crew
*Busy the Year Round***



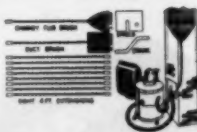
Most fuel companies and heating equipment people recognize the importance of Furnace Cleaning as a profitable business. Many service companies occupied almost entirely in the servicing and repair of heating plants find a field of greater profit in adding furnace cleaning to their services.

In summer, the normal off-season period, furnace cleaning keeps your service crews profitably busy.

General Electric Furnace Cleaners are compact, easy-to-handle and built for extra-heavy duty. They convert quickly to powerful blower action for loosening soot and grime in stubborn corners. Easy mobility makes a hit with cleaning crews. You get more work jobs and can keep busy the year round.

G-E Chimney Cleaning and Air Duct Equipment

Makes job go faster. Prevents soot from escaping into cellars. Revolving handle and vacuum hose fit through special shield that scoops up falling soot. Set includes Shield, Crank, Chimney Flue Brush, Duct Brush and 32 feet of extensions.



Mail coupon for details.

Furnace and Boiler Cleaners

GENERAL  ELECTRIC

GENERAL ELECTRIC COMPANY, Dept. 22-4119
1285 Boston Ave., Bridgeport 2, Conn.

Without obligation, please send complete details on heavy-duty cleaning equipment.

NAME _____
FIRM _____
ADDRESS _____
CITY _____ STATE _____

for funds for non-defense housing in the usual manner of the agencies which require appropriations. The president of the American Federation of Labor asked that the bill be revised to require lower rents for privately-built defense homes, and to impose stronger rent controls. A number of witnesses have suggested that the rents are too high, and that they might be lowered by lengthening the amortization period, thus reducing monthly payments.

There seems to be universal agreement that defense housing is needed quickly. The CIO suggests a total program of 200,000 units of military housing and 100,000 units of government housing for low-income groups. Defense Mobilizer Charles E. Wilson sent a letter to Chairman Maybank urging immediate approval of the housing bill. He says that it is needed to prevent the mobilization program from suffering "serious and crippling delays. Acute shortages of housing and community facilities are already developing in some areas."

Housing and Home Finance Administrator Raymond M. Foley urges that the proposed law is standby legislation. He emphasizes that some provision of law is necessary quickly in order that government may act in an emergency. He points out that over-all there is no material difference in this law from the Defense Housing Act that guided the government's activities during the World War II period, except that it provides \$10 million to buy building sites where speculators might attempt to corner the market. He stresses that in the event of an

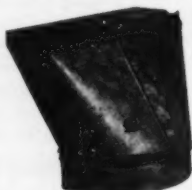
emergency, curbs on building will naturally be relaxed to the extent that it may be necessary; also that the law does not place a ceiling on profits but on rents.

The investigations, and the surveys, to be made in the immediate future by members of the Senate will focus on the operations of Wm. Leavitt, who has been extraordinarily successful in producing a two-bedroom home which he has sold to GIs, and others, at prices ranging from \$6,000 to \$8,000. The houses have asphalt tile floors, unfinished attics, and similar economies. But the house is a good house, and appears to be enormously popular. Leavitt is said to have built thousands of these houses in Norfolk, Virginia and in other places, but especially on Long Island. He has blanketed Long Island with his houses from one end to the other. While they all are built according to a similar interior plan he gives the exteriors variety. Congress is extremely interested in the operations of the dynamic Bill Leavitt — who has been written up in *Life* — particularly since he has vigorously proposed to take over the housing projects for the workers at the new atomic plant sites near Aiken, South Carolina, and Paducah, Kentucky.

There is every likelihood that Congress will make a very particular, and intensive study to discover why Leavitt is so successful in his operations. It is not beyond the range of possibilities that he may be invited to either help, or to take over the actual building program of the government defense housing. They are also interested in



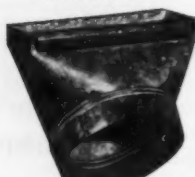
No. 112 BOOT



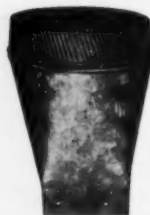
No. 110 BOOT



No. 113 BOOT



No. 111 BOOT



← No. 164 End of Line Center Takeoff. For use with 2 No. 163.

No. 160 Takeoff Round Pipe to carry branch in or below joist. ➔



GRAY "Snap-Rite" FURNACE PIPE AND FITTINGS AIR CONDITIONING PIPE AND FITTINGS

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3 1/4" standard depths. Trunk Pipe and Fittings in 8" standard depths.

Write for Catalog

GRAY METAL PRODUCTS, INC.
30 Carlton Street
Rochester 7, New York



S. J. Shanske uses SKIL Drill Model 47 on a door installation.

**"SKIL Drills do the job
where others fail"**

reports the Chicago Manufacturing Company

**EACH SKIL DRILL WORKS ON TRUCK
AND TRACTOR CABS 10 HOURS A DAY
... MAKES MORE THAN 20,000 HOLES A
YEAR IN STEEL 18 GAUGE OR HEAVIER.**

"You need SKIL Drills when you use tools as hard as we do," they say at the Chicago Manufacturing Company. While other drills overheat, stop turning, and fail, SKIL Drills stand up under this tough work load. No breakdowns! No trouble! Just hard driving, smooth-running, continuous power... power to get a good fast drill job done in heavy steel door frames and assemblies... power to keep going on one job after another, 10 hours a day, more than 20,000 holes a year for each drill.

You can count on performance like this on your job when you use SKIL Drills. SKIL Drills are compact enough to fit into tight quarters... light weight, easy to work with all day without fatigue. Your nearby SKIL Distributor will be glad to give you a demonstration in your plant.

SKIL Drill—Model 47

Heavy duty. Quarter inch capacity geared chuck with key and holder (Keyless chuck available) Standard speed 1800 r.p.m. with faster or slower speeds available. Weight 3½ pounds; length 7¼ inches.

SKIL
PORTABLE TOOLS



SKIL Products are made only by
SKILSAW, INC.
5033 Elston Ave., Chicago 30, Ill.
Branches in principal cities
In Canada:
66 Portland Street, Toronto, Ont.

ALFOL ASBESTOS insulated forced warm air unit. Metromatic Manufacturing Company, Everett, Massachusetts.



*"It's Insulated with
ALFOL
just like the Mt.
Palomar Telescope!"*

Alfol Reflective insulation was installed in the Mt. Palomar Observatory to provide maximum protection for the 200 inch telescope and its delicate instruments. The same Alfol reflective insulation is used by Metromatic to obtain maximum efficiency in the famous Metropac forced warm air unit.



Alfol Asbestos insulation is pure aluminum foil combined with flat or corrugated asbestos. Compared to standard inch thick aircell, Alfol Asbestos is 88% more efficient, constitutes 75% less bulk, has one-fourth the weight, and costs only half as much. One easy-to-handle sheet of Alfol Asbestos is equal in efficiency to 1½ inches of ordinary aircell asbestos.

It will pay you to try this light weight, modern insulating material. Write today for further information or send for free working samples and test it yourself! Address Dept. AA-1.

**FIRST IN
REFLECTIVE
INSULATION**
Alfol
REFLECTAL CORPORATION
155 EAST 44TH STREET • NEW YORK 17, N. Y.

another builder, a man who came to this country not so very long ago as an immigrant, named P. Dudiak, who has turned out a great number of popular and successful houses in New Jersey. He builds a more substantial house than Leavitt, and sells it at \$8,080. He puts in an oak floor, a good bathroom, and places shrubbery around the home. His product is attractive. He builds no garage, but he supplies the housewife many gadgets. He began operations on the 700 acres which at one time were the Bob-o-link Nursery in New Jersey. It is quite possible that Dudiak also will be drawn into the government picture.

The NPA amended its construction order M-4 to permit the building of structures for radio, television broadcasting, and as plants for the primary purpose of publishing newspapers, and as printing establishments operated by publishing companies chiefly for the publication of books and periodicals. The construction may be undertaken without authorization from NPA. Of course, no authorization for construction is required to build a private residence, even though it would include incidental space to be used by the occupant for office purposes, as in the case of a doctor's office situated in his private residence. Incidentally, John L. Haynes, well known as chief of the Building and Construction Division in the War Production Board from 1941-1944, and since well known as chief of the Construction Division of the Department of Commerce, was appointed

director of the Building Materials Division of NPA. It is a popular appointment.

If you are interested in negotiating for any of the business connected with the building of the housing units at military posts or installations, communicate with the commanding officer of the specific place where the construction is taking place, or is to take place. He has the power to make the arrangements, and to make agreements. He also can tell you the identity of the prime contractor if the operation is large. If you wish to be advised concerning announcements about such projects, write to the Office of Public Information, Department of Defense, Washington 25, D. C., and request that you be placed on the mailing list for such information releases. You may secure other information about defense business by getting in touch with the nearest regional or district office of the United States Department of Commerce, or with one of the 2000 chambers of commerce, trade organizations, banks, libraries and other public sources, scattered all over the United States, which have been designated to supply information about contracts to any one who may wish it.

The Department of Commerce assembles information from fifty-five defense procurement offices of the three military branches, and from twenty-two procurement branches of the General Administration Offices. Information about the lists of government invitations to bid are assembled and issued daily. They are neatly tabu-

only with **WILSON HAIR FILTERS** can you guarantee these exclusive features...

① 15% to 50% Greater Trificiency*

- * (a) Greater Dust-Catching Efficiency
- * (b) Maximum Air-Flow Efficiency
- * (c) Maximum Dust-Holding Capacity

② Full-Depth Dust Trapping

③ Cleaning Without Clogging

④ More Cleaned Air Per Filter

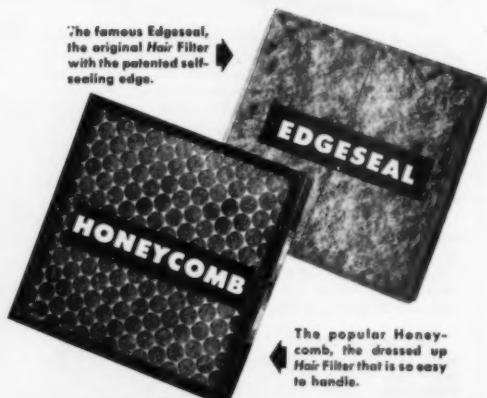
And—the reason is so obvious—it's the *hair* that cleans the air, so easily, so effectively, so economically. Mother Nature knew the answer, when she placed Hair (the ideal air filtering medium) in the nostrils of all mankind, as an essential part of the human air-filtering system.

WILSON & CO., INC.

(Air Filter Division), 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., Inc., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.

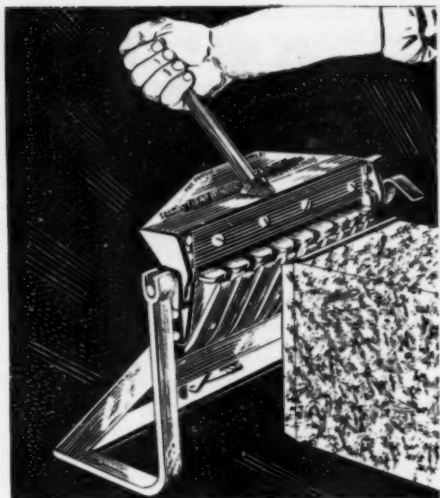
The famous Edgesal,
the original Hair Filter
with the patented self-
sealing edge.



The popular Honey-
comb, the dressed up
Hair Filter that is so easy
to handle.

Save delay. Save dollars. Save doubt. Send for FREE sample
with details and prices.





THE *Complete* DRIVE CLEATING MACHINE

Smith's Cleat Benders save wasted minutes that add up to hours . . . days . . . and weeks of needless effort. Works like a bar-folder in that a bend can be made and pinched down. Unlike a bar-folder or any other bender, it is so constructed to allow entering square ducts of various widths to make the bend.



R. E. SMITH

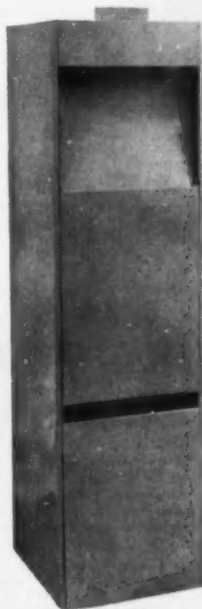
1513 MONROE STREET, WAUKEGAN, ILLINOIS

JOHN ZINK Central GAS HEATERS



MODEL AF-110

Here is truly a universal, efficient, simple, and compact CENTRAL HEATING UNIT. Fully automatic, it is a complete packaged unit ready for installation. The two heaters shown are almost identical in operation and design of the heat exchanger. The two different types of casings are furnished to meet requirements for a particular application.



MODEL HS-110

Heaters may be installed in the basement, attic, service closet, or utility room of a home. The AF-110 may be installed even under the house if certain provisions are made for the draft diverter. For industrial applications, it may be installed on a shelf or balcony; as a suspended heater and as a duct heater.

Each John Zink Central Gas Heater is equipped with an automatic safety shut-off that is really automatic.

The John Zink Central Gas Heater is designed as a winter air conditioner with a summer switch to provide air circulation during warm weather.

Write for Literature

JOHN ZINK COMPANY

4401 South Pearl

TULSA, OKLAHOMA

New York — Salt Lake City — Houston — Los Angeles

TURNER

80th

ANNIVERSARY LINE
QUALITY SINCE 1871



No. 475 *Low Pressure* TINNER'S FIRE POT

- ★ Ready for operation in 5 minutes.
- ★ Fuel capacity one gallon; burns for 9 hours on one filling.
- ★ Safer... reduces fire hazard of old-style charcoal burners.
- ★ Soldering iron rest keeps points of soldering coppers out of direct flame... saves re-tinning.
- ★ Complete with Turner's exclusive "Carburetor Control"... providing solid blue flame with more perfect combustion; also a flame control—for exact heat desired—which automatically cleans the orifice, thereby eliminating need for separate cleaner wire.
- ★ Construction assembly permits quick, easy accessibility and cleaning... wind-shield, top-plate, and bail handle are one unit, and can be lifted from tank in five seconds by loosening one wing nut.
- ★ Burner coil made of extra-heavy seamless steel tubing... protected by sturdy outer jacket that maintains heat without overheating... can be generated and used in heavy wind.
- ★ The combination may also be used for melting purposes.

See Your Jobber

THE TURNER BRASS WORKS

SYCAMORE ILLINOIS
Since 1871

lated, giving the name and location of the office calling for the bid, number and type of items in the prospective order, and the date on which the award will be made. This date is usually two or three weeks distant from the day the bulletin is issued. You must arrange to call for the information daily on your own initiative. The information is not distributed by mail to individuals or industrial firms by the government. The Department of Commerce also issues each week, usually on Thursday, a list of the contracts placed by the government, giving the type and size of each contract, and the prime company which has secured the contract. It is assumed those who wish to do business with prime contractors and subcontractors, rather than direct with the government, will wish to study these lists each week.

These lists also are available at the 2,000 points mentioned, as well as at district and regional offices of the Department of Commerce. You may also obtain from the Department of Commerce a list of the activities classified as essential to defense. Most contracts now, by executive order, are directly negotiated on the theory that such negotiation saves time. So few are publicly advertised that the staff of the House Small Business Committee recently issued a report announcing that the Navy, which normally buys tools and similar equipment for all services, is now issuing less than one bid invitation a day. Not long ago it issued twenty-five invitations to bid daily. Not a single bid invitation has been advertised the past month by any of the five Army Quartermaster's Offices.

The implication in the report is that the new system prevents smaller business from effectively participating in war contracts. It is a serious question in the light of the fact that the Defense Department expects to spend \$125 billion by the middle of next year. To further add to the gloom of smaller business, Defense Mobilizer Charles E. Wilson told the Joint Congressional Economic Committee that he opposes the setting up of a small defense plant corporation designed to channel government contracts to small business. He regards the present system as more effective. John C. Pritchard, who has a wholesale millwork and steel fabricating plant in Denver, has been appointed director of the Office of Small Business in NPA.

There has been a good deal of loose talk about the presumed iniquities of the modest operators in Washington — there are many of them — who earn fees by steering smaller businessmen through the labyrinth of Washington to some of the defense business. They give real service, usually for a reasonable compensation. It is this type of operator whom bugle-voiced Congressmen, and others, have smeared as five percenters. At regular intervals the stuffed shirts on the Hill, and the pompous brass in the Pentagon, sound off, warning the country against the five percenters. As a matter of fact, those who are the real offenders are the operators whom ex-Senator Joe Ball calls "the real influence artists who collect fees of \$5,000 to \$25,000 for

PEXTO . . . Best Buy



No. 0585—20 gauge

in CRIMPERS AND BEADERS

For combination crimping and beading
—crimping only or beading only—single
or ogee.

Available in three sizes:
24 ga. - 20 ga. - 18 ga.

THE PECK, STOW & WILCOX CO.

—SINCE 1785—

Southington, Connecticut, U.S.A.

PEERLESS OIL MASTER *Steel* winter air conditioning units and gravity furnaces



MODEL A
< < < <



> > > >
MODEL H
HIGH BOY

MODEL O
GRAVITY
> > > >



The Peerless OIL-MASTER Line of oil-fired Winter Air Conditioning units is expertly engineered to assure dependable burner operation — Clean, complete combustion — and maximum heating results from the fuel burned. Beauty of design and finish combined with highest quality of materials and workmanship provide all that can be desired by your customers. Peerless produces a complete line with units for Oil, Gas and Coal. Ask for the "Flying Saucers" Broadside.

The Peerless Foundry Company, Inc.

1853 Ludlow Ave.

Indianapolis 7, Ind.

Pioneers in Warm Air Heating Equipment for almost half a century

a few hours work and a telephone call or two to personal cronies in strategic government positions." The moderate priced, modestly operating individuals who are tagged as five percenters do a real job. They know their way about the tortuous mazes of Washington, they know the people who, like themselves, are inconspicuous yet who have a decisive influence on much of the business of government.

The secret of getting government business is daily visits to the places where the business emanates; and keeping just a jump or two ahead in information about the things the government may wish to buy. These people get the information, advise their principals, either deliver the bids for them, or advise them where to find prime contractors with whom they may do business. Despite what you may read in the occasional blasts of warning from the Pentagon and elsewhere, you can rest assured that it is to the best interests of most smaller businessmen who want government business, to make a connection with one of these consultants. It is very difficult to secure business, and to secure reliable up-to-the-minute information and counsel at a distance, despite announcements that may come from government agencies. To those who are eager for defense business the services of the so-called five percenter are invaluable. It is easy to find decent and reliable men and women who will give you such service at a reasonable cost.

NPA Office of Small Business makes these suggestions

for smaller companies that wish to secure defense business.

1. Prepare a general description of plant, facilities and location.
2. Prepare list of equipment with brief description of type, kind, size and condition of machines. This is important because it supplies a prime contractor with the information which will enable him to determine the size and character of the work which can be done in the subcontractor's establishment.
3. State how much machine capacity is available. Describe the products which are now being made or have been made in the past. Indicate at what rate present products will continue to be made if production is to continue. The prime contractor will want to know what priority a subcontractor will give to the prime contractor's orders. The clearer the description of products the better the prime contractor can gauge the subcontractor's ability to deliver what the prime contractor needs.
4. Indicate capacity, or source of new tools. The prime contractor will wish to know where the tools come from so he may get an idea how long it will take to tool up for the job he has in mind.
5. What are the delivery facilities and is there a railroad siding near? Can shipment be made by air?
6. Give description of the organization and some information about key personnel. Their experience

HESS

*when in Chicago —
be sure to visit*

*our display of the finest in
warm air heating equipment*

132 NORTH CLINTON ST.

**Just across the street from
Chicago & Northwestern**

The Hess Company

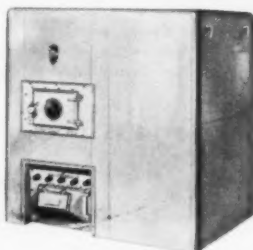
Chicago 6, Ill.

Our 78th Year

Since 1873



Hess Climate Master models available in wide range of capacities — for any fuel.



Self-Tapping Screws Hold Better!

Use These STAINLESS STEEL SCREWS

Available in Standard Diameters and Lengths Types A or Z

Round • Pan • Stove Flat and Oval Heads

Slotted or Phillips Recessed Heads

All Types of STAINLESS RIVETS Available, too

PROMPT DELIVERY

SEND, ON YOUR LETTERHEAD, FOR CATALOG 49J.

STAINLESS STEEL FASTENERS

MANUFACTURERS SINCE 1929

ALLMETAL

Screw Products Co., Inc.

33 GREENE STREET, NEW YORK 13, N. Y.



Just a breeze

...keeps Western Rotary Turbine Ventilators in operation, providing constant "round-the-clock" exhaust. Western's lifetime-guaranteed bearings are both mounted on the same axis...always stay in alignment...stand up to shipping jolts. Throat sizes from 6" through 48". The typical, clean, attractive silhouette that progressive industry demands. Western turbo-ventilation...high in efficiency, low in cost.

Request our catalogue for information, sizes, capacities, price lists. In 1951 Sweets and A.E.C. Jobbers are invited to participate in our national sales system.

"Always on the job—never on the payroll"

WESTERN ENGINEERING & MFG. CO.

1726 28 E. WASHINGTON BLVD. LOS ANGELES 31, CALIF.

PIPE AND FITTINGS GUARANTEED QUALITY!

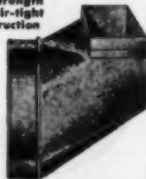
All Ajax fittings are made of high-grade, full gauge sheets...no seconds used! Quality is fully guaranteed. Your order, large or small, receives prompt, personal attention.



Scientifically designed to reduce air friction

For help on your heating problems our engineering department is at your service. Contact us...we'll gladly work with you.

Double seamed for strength and air-tight construction



Write for catalog of Furnace Fittings.

Ajax Furnace Fitting Co.

Division of

The Cincinnati Sheet Metal & Roofing Co.

216-20 E. FRONT ST.

CINCINNATI, OHIO

NEW STANDFORD

"BEND-EZY"

FORCED AIR REGISTERS and GRILLES

Smartly Styled...Efficiently Designed for Sidewall and Baseboard Installations

The Standford "Bend-Ezy" sidewall registers are stamped from sheet metal and have horizontal bendable bars, set at time of fabrication for 30 degree downward deflection. Each bar can be easily readjusted with a "Bend-Ezy" tool to any angle for upward, downward or straight flow.



Illustrates how easy it is to set the bars with a "Bend-Ezy" tool. SINGLE DAMPER REGISTERS with bendable bars

Write for NEW Catalogue—

Contains complete information—fully illustrated

- FLOOR REGISTERS, One-piece frame construction.
- GRAVITY BASEBOARD REGISTERS
- COLD AIR FACES
- PERFORATED METALS FOR EVERY INDUSTRIAL USE

PROMPT DELIVERIES

Standard Stamping & Perforating Co.

3137 WEST 49th PLACE • CHICAGO 32, ILLINOIS

THE CINCINNATI ELBOW COMPANY

2021 Eastern Ave.

CINCINNATI 2, OHIO



ALL SIZES
ALL ANGLES
ALL GAUGES
ALL METALS

See Your Jobber



**CONDUCTOR PIPE
ELBOWS and SHOES**

they all
want

AIR-FLO

MODEL
A-555

THE
AUTOMATIC
SHUTTER
WITH ALL THE
FEATURES

Front View—Closed

IT TAKES THE LOAD OFF THE FAN!

Aluminum louvers open fully, permitting capacity fan operation. New heavy reinforcement strip adds strength and long life to the louvers, assures quiet operation and perfect counterbalance, prevents rattling. Deep shroud protects shutter from high winds. Tie-rod, brackets and bearings inside frame, not exposed to weather. Special finish resists corrosion. Many other features.

Write for New Air-Flo Catalog 43-C

Illustrations and details of the complete Air-Flo line.

AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. • DETROIT 16, MICH.

may be a good selling point. Indicate the number and kind of employees on payroll, and any other pertinent information about the labor force and the available labor supply.

7. Are adequate cost records maintained, records which would satisfy government requirements? Can such records be verified by government audit? May government obtain copies of invoices to the prime contractor? Or invoices from suppliers?
8. Prime contractors are interested in the current financial rating of those they are considering as subcontractors. Prime contractors often supply subcontractors with expensive materials and tools, and before doing so want to know something about subcontractor's financial standing.
9. Outline previous experience as subcontractor if there is such previous experience. Names of companies for which subcontracting has been done, and what has been produced for them, should be supplied.

Fair—

(From page 59)

47½ years, while the average age of those in the inferior grade was 41. There is little evidence that older workers produce less.

The relation of age to frequency of labor turnover is of importance. It has been found that the older worker remains on a job longer than does a younger

BEVERLY SHEARS SAVE TIME · LABOR · MATERIAL

Make any cut—curved, straight or irregular, faster, easier and better with less material waste on a Beverly Throatless Shear. You can turn work to any position and make a clean cut as you go. Handles heavy gauges with ease—lighter metals without distortion. 4 models—capacities 18 gauge to ¾" mild.



B-3 with
Ball Bearing
Hold Down



INSIDE SLOTTING
8" Reach—16 ga. capacity

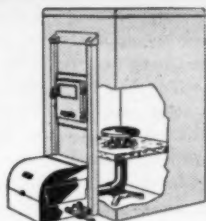
Makes inside slotting cutting faster, easier, cleaner. Punch and die arrangement of 5 blades assures accuracy, clean cutting action. Cuts 2½" x 1/8" or 2½" x 1/16" slot at one stroke. Throat design permits pivoting work at any point in stroke for special inside cuts. Note sample cuts at left.

See your Beverly Dealer or write for illustrated catalog.

Beverly SHEAR MFG. CO.
3020 W. 111TH STREET • CHICAGO 43, ILLINOIS

ANCHOR

FILLS
95%
OF YOUR
CONVERSION
TO GAS NEEDS!



Adaptable to round or square furnaces, gravity or forced air, hot water or steam boiler. Easy and profitable to install. One size only with simple adjustment to regulate height of burner. Peak performance with natural, mixed or manufactured gas. Easily adapted to L.P. by changing part. Fully approved A.G.A. and meets your local regulations. Approved F.H.A. financing. One year factory guarantee. Keep your stock of floor samples complete. Order this Anchor No. G-75-AN today, or

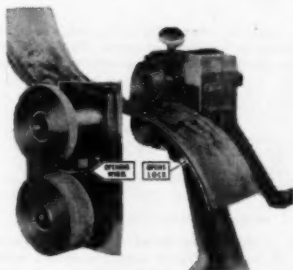
Write for free, descriptive literature today!

ANCHOR DIVISION, STRATTON & TERSTEGGE COMPANY
P.O. BOX 311 NEW ALBANY, INDIANA

AT LAST **BIRKS**

Pittsburgh Lock Opener OPENS

Curved or Straight Sections
for easy assembling



Saves

Time . . . Labor . . . Injury

Only \$45.00 — Order Now

IMMEDIATE DELIVERY FROM STOCK
(Shipped prepaid if check with order)
Satisfaction guaranteed or money refunded

BRISTOL METAL WORKING EQUIP.

532 Front Street

Hartford, Conn.

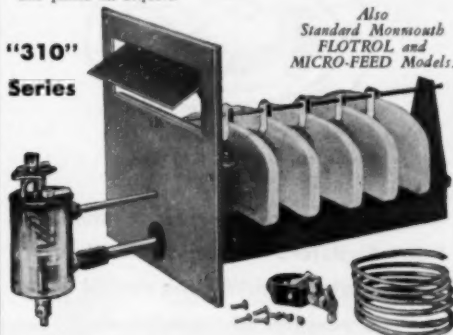
WHOLESALE—order sample at maximum discount

MONMOUTH HUMIDIFIERS

● The "310" is designed for modern smaller furnaces and air conditioning units up to 100,000 BTU capacity. It is shipped completely assembled, and quickly installed from outside the furnace. Front plate includes combination plenum register and inspection door, is hinged to copper pan and fits vertical or slanting plenum. Register has pivot shut-off valve, and equals an 8 x 4 register in free area. The "310" has genuine Flotrol valve and Monite ceramic diffusing plates. Details and prices on request.

"310"
Series

Also
Standard Monmouth
FLOTROL and
MICRO-FEED Models.



The Cleveland Humidifier Company
7802 Wade Park Avenue, Cleveland 3, Ohio



**Save TIME
on every job**

use "Made-Rite" fittings

One sure way to KEEP down job time is to check on the time spent in assembling warm and cold air runs. If it's excessive according to accepted standards then you'll do well to change your source of fittings.

That's the time to check with us . . . Made-Rite is a superior line of furnace fittings that will enable your men to work at top speed with no time lost in cutting or juggling. If you'll write, we'll prove it to you!

We solicit
inquiries on
material up to
36" wide
and 16 ga
and lighter.

"Made-Rite" Co., Inc.

10th and Monroe St.

Newport, Ky.

Midco Register Corp.
1059 Grand Ave.
St. Paul, Minn.



**Registers — Grilles — Floor Faces —
 Floor Registers — Gravity Registers.**
The complete quality line for all winter and summer air conditioning.

**MAKING FITTINGS
 COSTS YOU MONEY**

We can make fittings faster than you can! Here at Youngstown we are geared to volume production of quality fittings. Our high speed machinery turns out Youngstown precision fittings at a cost that means profits to you.

Almost every type of fitting to complete a great variety of furnace installations can be found in the Youngstown catalog. Call your local jobber today. For special assistance or information write directly to us. . . .

YOUNGSTOWN FURNACE CO.

627 Marshall Street

Youngstown, Ohio

one. Studies have shown that the greatest occupational mobility took place under the average age of 35. Thereafter, there was little shifting to new occupations.

Perhaps the most common reason offered for discrimination against the older worker is that he is more prone to accident than the younger worker. Study after study has shown the contrary, that the accident rate is highest for the younger workers. The fact that the older man is more careful is important.

On the average, it is undoubtedly true that there is more illness among older workers than younger ones. The development of more and better preventive cautions and more education as to physical care is reducing these figures daily, however.

Experience has shown the older worker has definite assets in skill, patience, sobriety, loyalty, better morale, endurance for routine work, greater safety, reduced absenteeism and better discipline. On the liability side there are found certain disadvantages some of which are at variance with the general assets because of the differing experiences of employers. These include inability to do heavy work, impatience with younger or less skilled workers, and less ability to learn quickly.

The current situation calls for understanding of the older worker and fitting him into our shop. It is certain that the sheet metal shop management that has secured an understanding of handling more and more older men on the staff and which has been adapted to

WHITNEY LEVER PUNCHES

No. 6 Punch



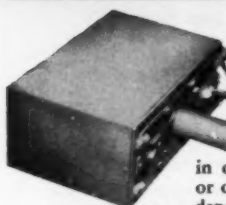
This Tool is especially adapted for Button Punching or for Templet work. Punch will strip where handle cannot be opened to 90 degrees.



These punches are often called Tip Punches, and are used to fasten standing seams without making a hole, by simply indenting the three thicknesses of metal.



A "Double Feature" BURNER



The Siemon Gas Burner is an extremely efficient heavy duty burner, which can be installed as a straight gas burner or in combination with an oil burner, or oil can be added later. Maximum dependability and economy — completely automatic.



A conversion burner with many new features at an economical price offering maximum efficiency.

NEW CONVERSION BURNER



WRITE FOR LITERATURE AND DETAILS

SIEMON & CO., 1819 Holmes St., Kansas City, Mo.

RINGS ALL TYPES

BAR, PIPE AND TUBE
STOCK
ACCURATELY ROLLED
ALL SIZES

Angles, tees, rounds, channels, flats, pipe and tube — all rolled in our plant to your exacting requirements, both as to production and delivery.

Leg out angle rings without holes are carried in stock in many sizes — furnished with or without bolt or rivet holes.

Write for list of stock sizes and discounts, also our circular describing our complete fabricating services.

For further information write us or phone Bishop 7-4255.

**NATIONAL
METAL FABRICATORS**

2136 South Sawyer Avenue
Chicago 23, Illinois

**TO YOUR
INDIVIDUAL
SPECIFICATIONS**

Meet The Emergency With a Super Red Streak



National emergency makes care of all kinds of heating equipment of first importance. Super Red Streak Furnace cleaning prolongs the life and efficiency of all kinds of heating plants. Chimney cleaning tools are standard equipment.

Efficient suction tube scrapers are available for fire boilers.

The Super Oil Soot filter bag for oil burning furnaces may be had at a nominal extra cost.

The FREE Super Sales Plan Book shows you how to operate a profitable furnace cleaning business.

Ask your supply dealer or write for our 5-day FREE trial offer, and demonstrate to yourself the earning power of the Super.

● Support local enterprise. For entertainment go to the movies.



National Super Service Company, Inc.
1944 N. 13th St., Toledo 2, Ohio

SUPER SUCTION

SINCE 1911
"THE DRAFT HORSE OF POWER SUCTION CLEANERS"

CORRECTION NOTICE

ATH-A-NOR

Ath-A-Nor coal furnaces are not high priced—in fact Ath-A-Nor is the lowest priced quality coal furnace you can buy — Ath-A-Nor has more selling features. The only coal furnace with the efficient Ath-A-Nor Air Blast. Write for prices.

Coal Gas & Oil Furnaces & Parts

MAY-FIEBEGER COMPANY

MANUFACTURERS OF QUALITY HEATING
EQUIPMENT FOR OVER 50 YEARS

Newark

Ohio

**NOW is the TIME
to "CLEAN-UP"**

with a

GRAND RAPIDS FURNACE CLEANER

Act Now! Get in on this year's cleaning profits.
Order a **Grand Rapids Furnace Cleaner**.

IT'S FAST—Handles twice as many jobs as the ordinary furnace cleaner.

IT'S THOROUGH—High velocity suction completely removes ashes, soot, scale and dirt from every type of heating plant.

IT'S COMPLETE—A packaged unit with practical cleaning attachments designed for fast, easy cleaning.

IT'S PROFITABLE—The trouble-free operation and speedy service of the Grand Rapids Furnace Cleaner puts extra profits in your pockets.

Send today for complete information about the Grand Rapids Furnace Cleaner.



DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W.

Grand Rapids 7, Michigan

**AN ODDS
ON FAVORITE
E-Z-ON DAMPER
REGULATORS**

Order from your Jobber

M. A. GERETT CORP.
MILWAUKEE 5, WISCONSIN

production by these older men, will have the jump in smoother continued operation when and if such a time does come where shortage of younger workers becomes extremely acute.

It is going to pay to give a lot of attention to the older men *today* so that we will have them *tomorrow* when we may suddenly need them very badly!

Markstein—

(From page 65)

in rich masculine colors—a style for every occasion. Jarman's superlative craftsmanship of fine, long-wearing leathers assures you smooth finish and gratifying service. And for the ultimate in foot-snuggling ease each pair gives you Jarman's famous friendliness of fit."

Some of the nation's singing-est advertising copy is written for Nash automobiles. It does not forget to appeal to the important human urges. From first sentence to last, every word of Nash copy bears down on telling people how their urges can be satisfied:

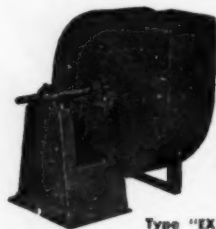
"Step into a 1950 Nash Airflyte.

"Relax, if you like, in a heavenly-soft Airliner Reclining Seat that's five-ways adjustable—or, if you want thrills, you be the driver.

"At throttle touch, the road starts racing backwards. There's new Nash Super-Compression power—and it's terrific.

"But listen—where's the wind-roar? The usual

INDUSTRIAL EXHAUSTERS



Type "EX"

Tailored to suit the characteristics of blow-pipe systems. Available for high temperatures and corrosive atmospheres.

Wheels balanced statically and dynamically for long life.

Full range of sizes for various pressures and capacities.

Accepted everywhere for dependability and proved performance.

Agents in principal cities.

Complete data on request. Write for
Bulletin EX.

BAYLEY BLOWER COMPANY

6602 W. Burnham St. Milwaukee 14, Wis.

CHELSEA FANS

FOR RESIDENTIAL AND COMMERCIAL NEEDS

— provide quiet, low-cost comfort cooling —

TWENTY-FOUR HOURS A DAY!

CHELSEA fans for home, store, shop, office, school, hospital, hotel, etc.—are guaranteed for efficiency and economy. Air delivery ratings of all CHELSEA products are determined by P.F.M.A. test methods — your assurance of plus performance!

COMPLETE PACKAGE UNIT TYPE EH FOR WALL MOUNTING—For homes, schools, churches, hotels and hospitals. Features large air delivery with low power consumption. Complete with automatic outside shutters, springs, mounting chain and canvas boot. Nine sizes from 24" to 60"; capacities from 5100 to 27,900 CFM.

FEATURING CHELSEA'S EXCLUSIVE SPRING-MOUNTING!

PACKAGE UNIT TYPE EV FOR ATTIC FLOOR INSTALLATION

Designed for attics of low headroom, this Chelsea package unit is complete with automatic ceiling lever, brackets and springs, canvas boot, etc. Quiet in operation, economical to install. Sizes 24" to 48".

CERTIFIED RATINGS

GUARANTEED PRODUCTS

All Chelsea Fans are certified as to delivery ratings in accordance with the standards of the P.F.M.A. Every Chelsea product is conditionally guaranteed as to workmanship and materials for one year.

25 TYPES . . . OVER 150 SIZES!

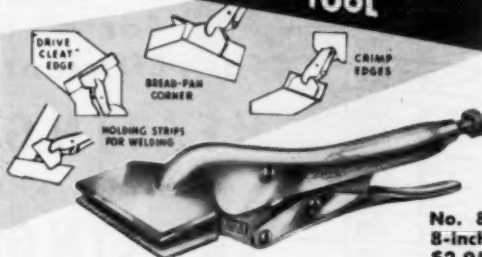
Write for new catalog and price sheet showing the complete line including sum, enclosed and custom-proof material. Address inquiries to Department 5 — no obligation.

Chelsea Fan & Blower Co.
INCORPORATED
PLAINFIELD, NEW JERSEY



**Now! Sheet Metal Work
Is a Snap with . . .**

**WISE-GRIP
SHEET METAL
TOOL**



No. 8
8-Inch
\$2.95

Here's that remarkable tool that practically guarantees perfect sheet metal jobs. Just **LOCK** it to any type work—it can't slip! Eliminates tiresome hand gripping. In just a jiffy you can bend, seam, crimp, form, straighten—easier, more accurately, faster. Extra deep throat—up to 13 1/4".

Order From Your Supplier

Manufactured

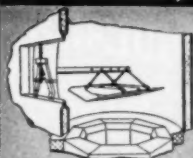
Only By

PETERSEN VISE-GRIP MFG. CO., INC.

Dept. AA-3

DeWitt, MoBr.

FOR Quality INSTALLATIONS



Boston Chrome Steel
"HANG-DOWN"
BAFFLE



APTHORP
True Alignment
OIL BURNER
NOZZLE

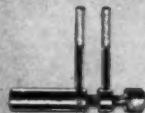
BOSMACO



Instant-Glo
COMBUSTION CHAMBER



The Boston Standard
DRAFT CONTROL



Ideal
NOZZLE EXTRACTOR



Clearview
OIL TANK GAUGE



BOSMACO
Apthorp NOZZLE KIT

WRITE FOR COMPLETE INFORMATION

BOSTON MACHINE WORKS COMPANY

Oil Heating Supplies Division, Manufacturers, Lynn, Mass.

Am-Pē-Co SINCE 1929

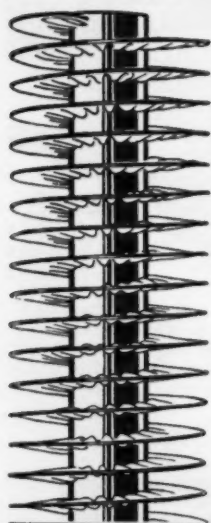


FIRST furnace blower made commercially in the Middle West. . . **TWENTY** years of service in thousands of homes . . . continuing demand is **PROOF** of **PREFERENCE** for **QUIETER** operation.

It's the operation that counts in a blower. Rugged operation that's "Quiet as a Cat's Purrr" and long life are assured when you install the **UNIPACK**.

AMERICAN MACHINE PRODUCTS CO.
MARSHALLTOWN, IOWA

AEROFIN



FIN-TYPE COILS
For
Fast, Efficient
HEATING
and
COOLING

*Write for
Information*

AEROFIN
CORPORATION
S. Geddes St. Syracuse 4, N.Y.

WHITNEY METAL
TOOL COMPANY
39 YEARS EXPERIENCE



WHITNEY-JENSEN
No. 455
ANGLE IRON COMBINATION

An unusually strong and compact unit for shearing, notching, and bending angle iron. Adaptable for one-time job work or permanent mounting in the shop. Floor space required—21-1/2" x 96".

Capacity—all sizes angle iron up to and including 2" x 2" x 1/4". Send for descriptive catalog.

WHITNEY METAL TOOL CO.
91 FORBES ST., ROCKFORD, ILL.

squeaks and rattles?—what's happened anyway?

What you say is the most important element in your copy. But how you say it counts too. In fitting the buy-points into that AIDA formula, there are certain words which will do a better job than other words.

Short ones are best. The longer your words, the fewer people there will be who can read them.

Sentences, too, should be short. A good rule is one thought to a sentence, one idea to a paragraph. No more.

"But," say some *Indoor Comfort* dealers, "my customers are not illiterates. They are able to read words longer than four letters, and digest thoughts more complicated than two-plus-two."

There is this fact about simplicity of thought, however. Some people are unable to take in complicated sentences or long words. But everybody can understand the simple words and sentences. Keeping them short, sweet and easy-to-read means that even the highly intelligent reader will be more likely to digest them.

Several years ago, Dr. Rudolph Flesch announced, in a book called *The Art Of Plain Talk*, several positive tests to discover the understandability of any piece of writing. (His book, by the way, is an excellent guide to anybody who writes ads; it can be obtained from Harper and Brothers in New York.)

In order to reach the great mass of American readers—some 75 million adults—the Flesch yardstick suggests three measures.

BARBER Gas Pressure
REGULATORS

"Made Better to Work Better"

Certified by
A. G. A. Testing Laboratory

The **BARBER GAS BURNER CO.**
3704 Superior Ave.,
Cleveland, 14, O.

Sizes 1/4" up

REGULATORS

"Made Better to Work Better"

Certified by
A. G. A. Testing Laboratory

The **BARBER GAS BURNER CO.**
3704 Superior Ave.,
Cleveland, 14, O.

**A BURNING QUESTION
FOR 1951...**

**How Can You
Sell Oil Heat
This Year?**

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638

19th National
**OIL HEAT
EXPOSITION**
and
OHI CONVENTION

Chicago, April 2-6, Navy Pier, Palmer House

Hammel

COMFORTAIRE

Winter Air Conditioner

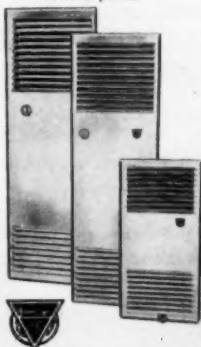
Representing the newest and finest in forced air, winter air conditioning. Gasfired and fully automatic, it combines winter heating and summer ventilating. Its compact design fits any plan and permits installation in a closet, small recess, basement or service porch.



CIRCULAIRE

The first fully vented, built-in single outlet and dual outlet wall heater in a complete range of capacities (11,500 to 50,000 BTU) and designed to fit into a standard 4" stud wall without framing. All units can be supplied, on order, for installation in a 6" stud wall.

Write for complete information and specifications to Dept. A.



COMPLETE IN ONE PASS!

—formed shapes of any design—



You merely feed the flat strip into the machine—out comes the finished shape.

- Production speeds up to 250 f.p.m.
- Machine shipped completely toolled.
- No experience required to operate.

Sketch or sample will bring prompt proposal

Dahlstrom Machine Works, Inc.

4974 N. Elston Ave.

Chicago 30, Ill.

Roll Forming, Slitting, Straightening, and Cut-Off Machines

Convert Gravity Furnaces With A CIRCULATAIRE Bonnet Blower



CIRCULATAIRE ELIMINATES COLD ROOMS, BALANCES HEAT DISTRIBUTION, SAVES FUEL

CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

NOW READY—New CIRCULATAIRE Sales Aids add effectiveness to selling interview, conserves valuable selling time and increases sales.

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.



GET THE FACTS TODAY! WRITE...

CIRCULATAIRE DIVISION OF CORLETT-TURNER CO.
1001 S. KOSTNER AVE., CHICAGO 24

THESE FACTS HAVE MADE

Reinhard

GAS CONVERSION BURNERS FAMOUS!

1. NEVER A HEAD REPLACED...
2. NEVER A BAFFLE PLATE REPLACED...
... Due to Burning Out.



Manufactured since 1932
AGA Listed

The "Air Lock" principle is an exclusive feature found only in Reinhard Burners.

The extreme efficiency, simplicity of installation and long life are backed by the

strong Reinhard Guarantee. No fans, blowers or ceramics are used. The Reinhard line includes domestic, industrial and commercial gas conversion burners. Write for FREE folder.

BETTER BURNERS ARE MADE... Reinhard makes them

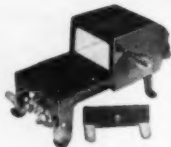
The House of Reinhard.
11 S. NINTH STREET - MINNEAPOLIS 2, MINN.

MORE HEAT FOR YOUR DOLLAR WITH JOHNSON BENCH SOLDERING FURNACES

1800°F. without forced air blast.

No. 101 Bench Furnace

The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox $3\frac{3}{4} \times 4\frac{1}{2} \times 5\frac{1}{2}$. Complete with work rest block and baffle plate. \$18.80 F.O.B. factory.



No. 118 Combination Bench Furnace

For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Two burners. Firebox $6\frac{1}{4} \times 5 \times 6\frac{1}{2}$. Complete with pot. \$35.00 F.O.B. factory.



WRITE FOR FREE
LITERATURE

JOHNSON GAS APPLIANCE CO.

580 E AVENUE N.W. CEDAR RAPIDS, IOWA

WE HAVE EVERYTHING!
INCLUDING
Experience

We consider our ages and experiences assets because our manufacturers have been able to find out a lot about us and our many uses. We are quality products and the original hermetically sealed pumps and vaporizers. Our housings are of die cast aluminum treated against corrosion in any water, our motors operate in a five years supply of oil, we have stainless steel screws throughout and we carry a two year guarantee.



The Little Giant Vaporizer projects water in a fine vapor-like spray. No more efficient unit can be found for use in evaporative coolers, humidity control, or cooling condenser coils.

The Little Giant Vaporizer Pump is a recirculating pump for a great variety of uses requiring low pressure, high volume performance.

Write for further information

Little Giant Vaporizer Co., Inc.
5101 CLASSEN BLVD. OKLAHOMA CITY

Number one is to have sentences no longer than eleven words (average).

Number two is to have no more than 26 prefixes and suffixes per hundred words. A prefix or suffix is something tacked on to the front or end of a word. An example teeming with both prefixes and suffixes is antidisestablishmentarianism. All of these letters and syllables have been added to the simple word establish.

Number three is to have about fourteen references to people in every average hundred words. These can be proper names like John Smith, or Mary Jones. They can also be common nouns such as *Indoor Comfort* dealer.

News Round-Up—

(From page 66)

Supp. to M-1—refers to the use of steel in the construction and repair of railroad freight cars.

M-2—refers to restricted uses of rubber.

M-3—refers to restricted uses of columbium bearing steel.

M-4—refers to restrictions on construction and remodeling of specified types of buildings.

M-5—refers to the use of aluminum.

Executive Order 10160—refers to necessity of preserving records covering transactions during the period May 24 to June 24, 1950.

A BURNING QUESTION FOR 1951...

**Will There Be
Sharp New Trends
For Oil Heat?**

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
PLaza Murray Hill
S-1628



Kirk-Blum

**...one piece
BLOW PIPE ELBOW
SAVES YOU MONEY**

- HOODS
- BALL JOINTS
- FLOOR SWEEPS
- BLAST GATES
- STAMPED AND ROLLED ANGLE RINGS

Cheaper and stronger than the ordinary pressed elbow, KIRK & BLUM'S One-Piece Elbows are rolled into a lock-seamed tube, then crimped on an exclusive machine to form a super tight, rigid elbow. These and other blow pipe parts, made in production quantities, are superior, cost less than the ordinary kind. Made in light to heavy gauges, from 3-inch to 14-inch diameter. Write for literature and prices.

THE KIRK & BLUM MANUFACTURING CO.
2880 Spring Grove Ave. • Cincinnati 25, Ohio

Ball Joints
Any Size

Majestic FURNACES *plus* PLANNING SERVICE

MAJESTIC heating engineers will gladly assist you to plan and estimate warm air heating systems—on the smallest to the largest jobs—to assure efficient, uniform floor-to-ceiling heat at low cost. You can rely on Majestic's 44 years of experience in heating developments, including the newest types of down-flow heating.

Wide variety of Majestic Furnaces—all sizes

This complete Majestic line offers units for any warm air heating need. Many are ideal for *defense and public housing; slab or crawl space construction; perimeter and convection heating.*



Get the benefits of this service on your defense and government housing projects that require low-cost, efficient heating.

Heating
Specialists
Since
1907

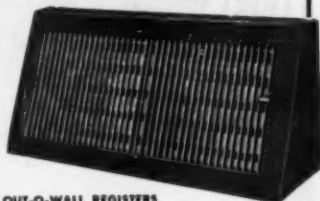
The Majestic Co.

394 Erie Street, Huntington, Indiana

Our heating engineers are ready to help you • Write

ROCK ISLAND

"... when it comes to registers, the best is ROCK ISLAND!"



No argument there! Any time you're talking registers or grilles

OUT-O-WALL REGISTERS
AND INTAKES

for lifetime performance and general all-around, old fashioned dependability, you're talking about Rock Island. Illustrated here are the famous Out-O-Wall for registers and intakes and the sturdy attractive floor register. They're what you need to complete a good job.



FLOOR
REGISTERS

Write
today for
our
complete
catalog.

ROCK ISLAND REGISTER CO.

2435 FIFTH AVENUE

ROCK ISLAND, ILLINOIS

PLENTY of PROFITS with

Double Suction FURNACE CLEANERS

KENT

Your KENT is engineered for performance... brings you profits... does a real job! You get valuable leads on new installations and repairs too!

- Low center of gravity, less chance of tipping!
- No outside dustbag, no dust passes through fan!
- Toggle switch with convenience outlet for extension light.
- KENT is built to last!



You're invited to the KENT Booth, No. 149, National Oil Heat Exposition, April 2-6 — Chicago, Ill.

The KENT Double Suction Furnace Cleaner separates into 2 parts for easy carrying:



CLEAN WITH **KENT** EQUIPMENT

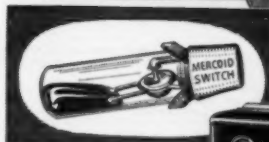
The KENT Co., Inc. • 435 Canal Street • Rome, N. Y.

USE MERCOID CONTROLS

FOR OIL BURNERS, STOVES, GAS BURNERS, REFRIGERATION, AIR CONDITIONING AND VARIOUS INDUSTRIAL APPLICATIONS

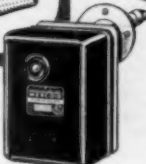


IT'S THE MERCURY SWITCH THAT DISTINGUISHES Mercoid FROM THE AVERAGE LINE OF CONTROLS



INSURING GREATER SAFETY, BETTER PERFORMANCE AND LONGER CONTROL LIFE

CATALOG SENT UPON REQUEST



IT PAYS TO GET THE BEST

THE MERCROID CORPORATION, 4201 BELMONT AVE., CHICAGO 41, ILL.

**QUIET AUTOMATIC
OIL FURNACES**

SUSPENDED OR LAYDOWN AIR CONDITIONING FURNACES



SPACE SAVER

Excellent for service stations, stores or businesses. Four sizes: 85,000 btu, 142,000 btu, 175,000 btu, 240,000 btu. Completely assembled with blower.

Other, insulated combustion chamber, the world famous Quiet Automatic Oil Burner with 2-stage pump and oil control.

WRITE TODAY FOR FULL DETAILS

QUIET AUTOMATIC BURNER CORP.

32-35 BLOOMFIELD AVE. near Broadway
NEWARK 6, NEW JERSEY

LOWN SLIP ROLL FORMING MACHINES



A new improved, modern design, heavy duty machine engineered for durability, strength, and service.

- Initial Pinch Type-Power Driven.
- Rolls 6" diameter, all driven.
- Oilite Bearings. Automatic Lubrication.
- Roll Position Indicators.
- Available in lengths from 3 ft. to 12 ft.
- Silent Chain Drive.
- Built with Power Adjustment on rear roll and air cylinder attachment if desired.
- Fast sturdy and easy to operate.
- Prompt deliveries.
- Other size machines also available.

Dealers in Principal Cities

Write for Bulletin

San Angelo Foundry & Machine Company
SAN ANGELO, TEXAS 1000 EAST UPTON

M-6—to insure stocks of steel products in steel warehouses.

M-7—Reduces amount of aluminum available for civilian purposes.

M-8—Rules for reporting on inventories, receipts, consumption, import, and distribution of tin.

M-4, Amended—Changes policy of NPA in regard to future extension of construction ban.

M-4, Amended—Clarifies and extends ban on construction for amusement or entertainment purposes.

Supp. to M-1—Program to provide steel for Great Lakes cargo vessels.

M-9—Rules for accepting and scheduling rated defense orders for zinc.

M-10—Limits cobalt inventories.

M-11—Copper and copper-base alloy distribution of rated orders.

M-12—To assure copper supplies for the expanding rearmament program.

M-1 and M-6, Amended—Revises lead time provisions covering handling of defense orders by steel producers and steel warehouses.

M-7, Amended—Usage of aluminum.

M-14—To assure supplies of primary nickel.

M-14—non-defense production and use of zinc products limited.

MILTON SHEET METAL MACHINERY SPECIALISTS

DO YOU HAVE PROBLEMS ???
We Can Help You Solve Them By
Furnishing The Proper Machines.
We Carry A Complete Stock of New
& Used Hand & Power Machines.
We Stock Punches & Dies & Adapters
For All Presses & Brakes, Shear Blades
& Spot Welder Tips & Hand Tools

MILTON EQUIPMENT CO.
N.E. Cor. 4th & Race Phila. 6, Pa.

**A BURNING QUESTION
FOR 1951...**

**Will Your
Competition Be
Stronger?**

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638



Chicago, April 2-6, Navy Pier, Palmer House

Grant Wilson DUX-SULATION

ASBESTOS PROTECTED

- ▶ INSULATES DUCTS
- ▶ ABSORBS SOUND
- ▶ SAVES FUEL
- ▶ STOPS CONDENSATION
- ▶ REDUCES POWER COSTS

WRITE...

Grant Wilson Inc.
ASBESTOS and INSULATING MATERIALS

141 W. JACKSON BLVD. • DEPT. A • CHICAGO 4, ILL.

GO-EZE

(Formerly Goose)

THE ORIGINAL TIME SAVER
DAMPER CONTROL



(Patented)

Try the new package. For the convenience of the sheet metal trade 3 gross in carton bulk all packed separately—also packaged.

Write us for new prices to the wholesale and dealer trade.

SEVERSON MANUFACTURING & SUPPLY CO.

1034 W. Somer St.

Milwaukee 5, Wis.



PENN-AIRE FURNACES

Winter Air Conditioning and
Gravity

CAST IRON, COAL FIRED

Popular Price

Practical Design

Economical Operation

UNION MANUFACTURING CO. INC.
Boyertown, Pa.

LUSTRIK[®] ALUMILITED SHEETS

Processed metal for
a streamlined effect
in sheet metal work

- SIGNS & LETTERS
- ENTRANCES
- DOOR FRAMES
- DOOR COVERINGS
- FACIAS
- SOFFITS
- SPANDRELS
- BULKHEADS

Lustrik[®] Alumilited aluminum sheets have the stand-out features that appeal to every "sheet metal man." Here's a treated sheet that can be formed on a brake and cut with ease. Large panels save time — quickly and inexpensively erected. Ideal for the modern effect on stores, factories, service stations, etc. Available in flat, square streamlined, rib fluted, corrugated and cross crimped corrugated.

• Reg. U.S.P.

WRITE for free sample
kit and information

PHILADELPHIA RUST PROOF CO.
3225 Frankford Ave., Phila. 34, Pa.

SIMPLIFY YOUR BUYING!

You can save TIME by combining your orders for Conductor Pipe, Gutter, and Accessories with your orders for Galvanized Pipe, Fittings, Registers, and Cast Iron Furnace and Boiler Repairs.

ACT NOW! Your ordering will be easier, faster, and more economical when you buy in one large order

from

Iowa's Largest Heating Wholesaler

**DES MOINES FURNACE
AND STOVE REPAIR CO.**

Des Moines, Iowa

M-16 Amended. Prohibition on the acceptance of copper scrap for converting.

M-8 Amended. Use of tin.

M-19 Use of cadmium.

Notice 1. Materials subject to the anti-hoarding provisions of the National Defense Act.

Dir. 3 to M-7. Increase in the amount of aluminum that can be used during March.

M-10 Amended. Complete allocation of all forms of cobalt.

M-12 Amended. Permits use of copper for functional purpose.

M-20 Governs inventories of iron and steel scrap held by scrap dealers and brokers.

M-8 Amended. Permits smelters of secondary tin to use tin scrap.

Reg. 2 Amended. DO ratings may be used for procuring jigs, dies, tools and fixtures.

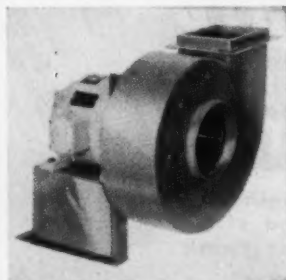
M-22 Order to prevent undue accumulation of aluminum scrap.

M-15 Amended. Definitions added to zinc order.

M-4 Amended. All private commercial construction to be subject to NPA authorization.

M-30 (Jan. 22, 1951) Provides for the allocation of all forms of tungsten—except tungsten ores and concentrates and tungsten scrap—based on end-use essentially beginning March 1.

M-14 Amended (Jan. 23, 1951) Further restrictions on the use of nickel. As of April 1, no more nickel may



AIRFAN is the answer!

Good jobs need good equipment. You can be sure the AIRFAN units on your jobs will remove any doubt of performance. Try AIRFAN on your next job . . . you'll see why "AIRFAN is the answer!"

***AIRFAN Industrial Exhaustor
Wheels dynamically balanced for smooth operation in removal of sawdust, emery dust, polishing, buffing, and grinding dust, and heavy fumes. Thoroughly tested under actual conditions.

***At night is the AIRFAN Air cooler — 2000 to 10000 CFM series. Correctly designed so maximum air at least resistance can flow through louvered grilles with minimum horsepower. Pans die drawn of one-piece special steel. Heavier gauge material than found in any other make.



AIRFAN ENGINEERING CO.

7403 Anaheim-Telegraph Rd., Los Angeles, Cal.

**A BURNING QUESTION
FOR 1951...**

**What's Ahead
in Fuel Oil
Supply?**

GET THE ANSWER AT THE

**19th National
OIL HEAT
EXPOSITION
and
OHI CONVENTION**

for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638



Chicago, April 2-6, Navy Pier, Palmer House

ADAMS

Sizes from
3 to 18 inches



Diamond Smoke Pipe Damper

Buy Adams Known Quality

THE ADAMS COMPANY
Bridge Street • Established 1883 • Dubuque, Iowa

Heating
Sheet Metal



Air Conditioning
Supplies

Furnace pipe, adjustable
elbows and fittings

ALSO: Complete line sheet metal hand tools

Frank X Enderle, Inc., Ltd.

1600-1700 San Fernando Road, Los Angeles 41, Cal.



STEEL BENDING BRAKES

HAND AND POWER MODELS

for Single and Quantity Runs
Bending Sheet Metal

PORTABLE HAND BRAKES
BOX and PAN BRAKES



DREIS & KRUMP
MANUFACTURING COMPANY



7404 S. Loomis Blvd., Chicago 36, Ill.

Elgo Ventilating
Specialties

YOU'LL PREFER THIS
AUTOMATIC SHUTTER

The "Elgo" gets the preference because of its outstanding features—such as its quick-opening, its tight-closing and the absence of blade flutter. Its weather-stripping and felt slanting pads are other notable features. Sizes from 8" to 72" square—also rectangular.

Write for circular and prices



"ELGO" TYPE
AUTOMATIC SHUTTER
Front View (Open)

ELGO SHUTTER & MANUFACTURING CO.

2738 W. Warren

Detroit 8, Mich.

Free
CATALOG

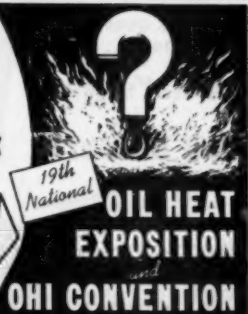
A BURNING QUESTION
FOR 1951...

**How Will
Government
Controls Affect
Your Sales?**

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638



Chicago, April 3-6, Navy Pier, Palmer House

A BURNING QUESTION
FOR 1951...

**What's New
In Oil Burner
Accessories?**

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638



Chicago, April 3-6, Navy Pier, Palmer House

**Copper - Brass - Bronze
Perforated
TO YOUR REQUIREMENTS**

PERFORATED METALS
FOR ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG #35
DIAMOND MFG. CO.

BOX 34

WYOMING, PA.

BRAUER has

REPAIR PARTS for all FURNACES
BOILERS, STOVES • *Guaranteed to FIT*

A. G. BRAUER Supply Co.

2100 Washington Ave.

St. Louis, Mo.



Designed Primarily for Residential Heat Loss Calculations.

CLIMATEMAKER HEAT LOSS CALCULATING SLIDE RULE

Gives the RIGHT Answers QUICKLY to:

- ★ B.T.U. heat loss per room. ★ C.F.M. required per room. ★ Pipe area, pipe and stack size for forced or gravity warm air heating. ★ E.D.R. of steam and hot water. ★ Blower size. ★ Figures outside design temperatures from 40 Below to 40 Above zero. Designs based on zero to 70°. Write Dept. AA-3 Easy to learn—Simple to use. ORDER NOW—

Copyrighted in U.S.A. and Canada. Checks on Canadian banks accepted at par.

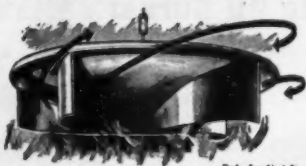
CLIMATEMAKER SLIDE RULE COMPANY, Inc.
1404 E. Washington St. Bloomington, Ill.

Cash
With
Order
75⁰⁰

DON'T JUST BAFFLE! GET SWIRLING ACTION TOO-

It pays to include a
FIRE-SWIRL with
every conversion.

Get the facts, clip
this to your letter
head.



Pat. Applied For

FIRE-SWIRL

ZEH COMPANY INC., PASSAIC, N.J.

MOREY FLOAT VALVES

Made Right Priced Right

List
Price
1.50



Packed
in
Dozen
Lots

Morey Valves close against pressure. Each operation washes neoprene seat. $\frac{3}{8}$ " pipe thread outside, $\frac{1}{8}$ " inside. Brass body $2\frac{1}{2}$ " x 3" copper float or 4" x 5" oval float. The ideal float valve for evaporative coolers, poultry feeders, small cooling towers and evaporative condensers.

Overall increase in Morey Valves in 1950 about 1500%.

Write for trade discount on

The Morey line of Recirculating Pumps, Cooler Pads, Float Valves, Special Woven Netting and Aspen Excelsior.

DAN MOREY

814 S. Robertson Blvd.
Los Angeles 33, California

CLEAN SWEEP SOOT REMOVER HAS A NEW NAME



It's still the same fine product that you can depend on for customer and service satisfaction
MILLER PRODUCT COMPANY
P. O. BOX 156 LANSING 9, MICH.

Successors to The Clean Sweep Co.

"LOOK FOR THE BROOM ON THE PACKAGE"

ORNAMENTS



STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING

89 ADAMS STREET

BROOKLYN, N. Y.

be consumed in sheet metal building applications.

M-8 Amended (Jan. 27, 1951) Bans use of pig and secondary tin except for specified purposes. Certification is required for all non-defense uses of tin plate or terne plate.

M-33 Amended (Jan. 27, 1951) Places temporary controls on distribution and inventories of molybdenum.

M-20 Amended (Jan. 29, 1951) Provides that the NPA can increase or decrease iron and steel scrap inventories in the hands of consumers, and allocate scrap and direct the manner and quantities in which deliveries shall be made.

M-7 Amended (Feb. 1, 1951) Prohibits the use of aluminum in a great number of products after April 1. Included are gutters, leaders, downspouts, residential roofing and siding, cornices and architectural ornamentation.

M-14 Amended (Feb. 8, 1951) Manufacturers of nickel alloy may not extend priority ratings to replace nickel used prior to Jan. 1 for the manufacture of stainless steel, high nickel alloy, or any other nickel-bearing alloy material.

M-4 Amended (Feb. 9, 1951) Revises the construction order to permit the building of structures for radio and television broadcasting, newspaper plants, and printing plants for book publishing.

M-38 (Feb. 16, 1951) Limits inventories of lead and antimony or materials containing the metals to 60 days' supply or a practical minimum working supply.

SAMPLES FREE
**SODER STAINLESS
STEEL RAPIDLY**



AT IT SINCE '08

FLUXES
SODERING
BRAZING & WELDING

ALLEN

L. B. ALLEN CO. INC. Chicago 31, Ill.

A BURNING QUESTION
FOR 1951...

What's New
in
Oil Burners?

GET THE ANSWER AT THE



for full information
contact OIL-HEAT
INSTITUTE OF AMERICA,
6 East 59th Street,
New York, New York
Phone: Murray Hill
5-1638

19th National

**OIL HEAT
EXPOSITION**

OHI CONVENTION

Chicago, April 2-6, Navy Pier, Palmer House

**A BURNING QUESTION
FOR 1951...**

**What's New
In Space
Heaters?**

GET THE ANSWER AT THE



for full information
CONTACT OIL-HEAT
INSTITUTE OF AMERICA,
6 East 39th Street,
New York, New York
Phone: Murray Hill
5-1638

**19th
National
OIL HEAT
EXPOSITION
and
OHI CONVENTION**

Chicago, April 2-6, Navy Pier, Palmer House

**MANUFACTURERS OF
FURNACE PIPE
AND FITTINGS,
Prefabricated Ducts,**

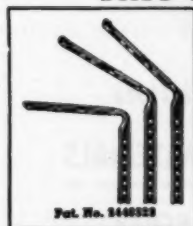


**also conductor pipe, eaves
trough, drip edge, rake strip, etc.**

THOR METAL PRODUCTS CO., INC.

Box 118 Eastwood Station Syracuse, N. Y.

IMPROVED!



Pat. No. 2440522

• B.B. •

**No. 12 SHANK
33 1/3% STRONGER**

IMPROVEMENT IS APPLIED TO
No. 15—SQUARE, No. 15—4
PITCH, AND No. 25—1/4 PITCH.

SOLD THRU LEADING
JOBBER EVERYWHERE

BERGER BROS. CO.

Main Office & Factory
229-237 Arch St., Philadelphia, Pa.

**"... the
best laid
plans ..."**

for 1952 will include a substantial schedule in AMERICAN ARTISAN beginning with space in the annual Directory Number in January. Your plans can't "gang agley" if you're represented in this field leading book, where a convincing story of your complete facilities will do untold good. Check with us now for rates.

FOR BETTER FIRES

IRON-HIDE
CHAMBERS-BAFFLES-SUPPORTS

**FURNACE MANUFACTURERS!
— ATTENTION —
LET US QUOTE ON A
COMBUSTION CHAMBER
FOR YOUR FURNACE.**

IRON-HIDE REFRACTORIES, INC.
DOCK STREET MATAWAN, N. J.

ENGINEERS

for research and development

Openings for graduate engineers to work in fully equipped, modern research laboratory. Must be experienced in the design of heating equipment and have the ability to supervise and carry out development projects, having both military and domestic applications. Write or call for appointment, giving full experience, information, and salary expected.

FLUID HEAT DIVISION

ANCHOR POST PRODUCTS, INC.

6500 Eastern Avenue

Baltimore 24, Maryland

ALMAR EASY SLITTER

FOR USE WITH BRAKE OR BENCH

Speed up your work—without an 8' or 10' Square Shear
The Rotary action of cutters
produces a neat, accurate
clean edge.



**PRICE—COMPLETE
Almar Easy Slitter**

with cutting head & track

8' Brake Type	—	\$79.00
8' Bench Type	—	\$85.00
10' Brake Type	—	\$95.00
10' Bench Type	—	\$95.00

F.O.B.—Chicago, Ill.

WARD MACHINERY COMPANY

564 W. WASHINGTON BLVD.

CHICAGO 6, ILLINOIS

**The Quality
Ventilator
for all
important
industrial
installations**

Swartwout-Dexter Heat Valve
solves many roof ventilating problems

**THE
Original
RIDGE
VENT**

The Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio

Classified

Classified section: Rates are 10 cents for each word, including heading and address. One inch \$5.00. Count seven words for keyed address. Minimum \$2.00 for each insertion. Cash must accompany order.

for sale

For Sale, Old established sheet metal shop in southern Illinois in new boom area, seven miles from new atomic and hydro electric plant being built now. Stock and tools at inventory, also 1 ton truck. Rent reasonable. Also appliance store, optional. Will inventory between \$9,000 and \$10,000. Write or see Scott and Hopson, 205-206 West Sixth Street, Metropolis, Ill.

FOR SALE — Have surplus stock on the following items. Will close out at 25% discount below your current cost. Lennox Prefab duct fittings. Boots, transitions, welding rods. Controls of all type. Heating, refrigeration and stoker. Nuts, bolts and shields. Tinned rivets. Miscellaneous sheet metal tools. Write for quotations. Address Kuhr Brothers, Inc., Savannah, Georgia.

For Sale: 800,000 yards cheese cloth. Widths — 36 to 48 inches. Dan Morey, 814 S. Robertson Blvd., Los Angeles 35, Calif.

Automatic Aluminum Louvers for 36" to 48" fans, save 15% due to overstock, made by leading manufacturer — Gichner, 1900 Kendall, N.E. Washington 2, D.C.

wanted

WANTED: Shearings any amount — all sizes Galvanized, cold and hot rolled aluminum. Stainless and copper 6" minimum width 36" minimum length, uniform quantities. Gauges from 16 to 30 inclusive.

Write or wire

Los Angeles Sheet Metal Mfg. Co.
901-903 East 9th Street, Los Angeles 21, Calif.
Trinity 4715

agents wanted

SALES REPRESENTATIVE WANTED — Capable of selling our service to heating, air conditioning, and refrigeration trades. Also to national users of heating and refrigeration equipment. Long established mid-western firm. Repeat orders, commission basis, exclusive territories available. Very profitable for man able to handle this since it is a service to the trade very much in demand today. Address Key #841, American Artisan, 6 No. Michigan Ave., Chicago 2.

Invest in the future

**BUY A U.S. SAVINGS
BOND EACH PAYDAY**

SERVICE SECTION

Rates for display space in the Service Section are \$10.00 per inch per insertion. One-inch minimum space accepted.



Various — Made available — Other handy Pioneer
Tools — Little Giant Pipe Crimpers — Gutter
Clamps — Steel Beam Trammels
See your jobber or write

PIONEER TOOL COMPANY

1103 Wisconsin Ave.
Racine, Wisconsin

FOLDING BRAKES

Form angles, flanges and Pittsburgh locks. 26 gauge steel. Cam locking. Can be bolted to bench, or edge of truck. All steel, reinforced. Shipped Express Collect, 30" size, Wt. 84 lbs., \$26.50. 36" Wt. 86 lbs., \$31.00; 48", 100 lbs., \$45.00. Floor mounting, 32" high, \$7.00 extra. Order direct, cash, or C.O.D., or send for folder.



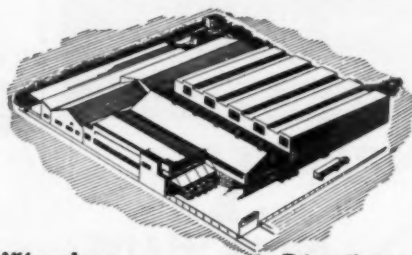
30"-36"-48"

VYKE BRAKE CO.

T-1116 S. 27th St., Omaha 5, Nebraska

GRAND RAPIDS FURNACE CLEANERS

Write for Details
**DOYLE VACUUM
CLEANER CO.**
227 Stevens St., S.W.
Grand Rapids 7, Mich.



Warehouse

Distributors

SPECIALISTS IN FLASHING MATERIALS

ERAYDO ZINC FLASHING ROLLS

(Extra Soft)

SOFT COPPER FLASHING ROLLS

TYPE 430 STAINLESS FLASHING SHEETS

ALUMINUM FLASHING ROLLS

FOLLANSBEE SEAMLESS FLASHING ROLLS

(20# Coated and Lighter)

Call us for all your Metal Flashing Requirements!

POTTS-FARRINGTON CO.

FORMERLY W. F. POTTS, SONS & CO., INC.

4250 WISSAHICKON AVE., PHILADELPHIA 29

PHONE BAIdwin 3-1000

SERVICE SECTION

HANDY TOOLS AND EQUIPMENT

Available for Prompt Shipment



A NEW CLIP PUNCH

For fastening slips or seams on ducts. Will push a "half moon" through 3 thicknesses of 18-ga. steel. No hammering or flattening out to fasten slip to the duct.

A DRIVE CLEAT NOTCHER

For notching drive cleats up to 3 in. in width, 22-ga. or lighter. Can be operated by hand or foot or can be easily mounted on the bench or on the job with clamps or bolts and screws.



Distributed exclusively by
REINER & CAMPBELL CO., Inc.
19 Euclid Ave., Newark 5, N. J.

SHEET METAL MACHINES & TOOLS

Lockformer Pittsburgh Machines
Lockformer Cleat Machines
Chicago Hand Brakes
Chicago Press Brakes
Pexto Power Shears
Pexto Foot Shears

Pexto Rotary Machines
Pexto Slip Rolls
Pexto Bar Folders
Smith Cleat Benders
Rex Spot Welders
Rex Power Rolls

Whitney Punches
Whitney Foot Presses
Whitney Machine's Tools
Pexto Machine's Tools
Van Dorn Electric Tools
Marshalltown Shears

When in Chicago, visit our Machinery Showroom

COMPLETE LINE OF SHEET METAL & VENTILATING SUPPLIES

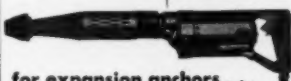
CENTRAL-WEST MACHINERY CO.

335 SO. WESTERN AVE

HAYMARKET 1-8360

CHICAGO 12, ILL.

How to drill concrete



for expansion anchors . .

You can drill holes thru concrete walls, floors, ceilings, 12 to 15 times faster than by hand. Use the Wodack D0-ALL Electric Hammer. Typical example: drills a 3/8" hole 1" deep thru average concrete in less than 15 seconds! Saves time and money. You also use Wodack D0-ALL for chiseling concrete, drilling wood, metal, etc. Investigate.

WRITE TODAY FOR BULLETIN 471-AA

Wodack Electric Tool Corporation
4627 W. Huron St., Chicago 44, Ill.

HEATING CALCULATOR



Solves Heating Problems Accurately

Works like a slide rule—reads like a chart. It's simple, easy and fast! Figures heat losses—warm air layouts—hot water and steam radiation. Price \$1.00 including valuable booklet.

CALCULATOR SPECIALTIES CO.

122 S. Michigan Ave.

Chicago 3

EVERYTHING FOR FABRICATING

BRAKES, POWER APRON

No. 203 D. & K.: 10" 12 Ga.
No. 204-S D. & K. PRACT. NEW:
10" 10 Ga.

BRAKES, HAND

10" x 14 Ga. DREIS & KRUMP
10" x 16 Ga. DREIS & KRUMP
10" x 18 Ga. DREIS & KRUMP
NEW NO. 420 & 520 CHICAGO STEEL

SHEARS, POWER SQUARE

72" x 16 Ga. Cap. NIAGARA
6' 14 Ga. PARKER

NIBBLERS

No. 336 SAVAGE: 3/8" Cap., 36" throat

No. 1 GRAY: 3/16" Cap., 34" throat
1/4" Cap. GRAY, 36" throat

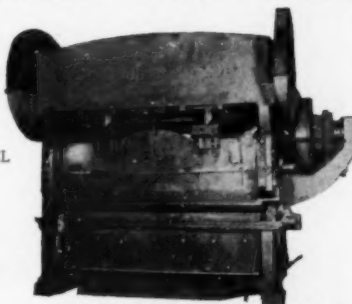
OBI PRESSES —

ALL TYPES — ALL SIZES

NO. 3036 PARKER MULTI-MAX
DOUBLE CRANK PRESSES: Late
type, 30 ton, 2" stroke, 10" shut
height, 12" x 37" Bed.

PRESS BRAKES

NEW NO. 335 D. & K.:
6' 14 Ga. Cap., 72" Bed & Ram.



NEW 10' 1/4" UNIVERSAL HYDRAULIC:
10' 10 Ga. OHL

NO. 1062 VERNON: 52" 14 ga., 62" Bed,
78" Bed & Ram.

NEW NO. 35-6 & 35-8 MILWAUKEE
NO. 126 CHICAGO STEEL: 32" Length
of bed & ram, 18 ga. Cap., 26" bed.

88 TON CAP. D. & K. GAP FRAME
WIDENED BED BACK GRD.: Dbls.
Crank, 16" x 65" Bed.

MODEL C-34 STURDY-BENDER ALL-

STEEL 34 ton cap., 51" bet., 96" Bed
& Ram

ROLLS, POWER

60" BUFFALO INITIAL TYPE THREE

ROLL: 1/4" Cap., 7" Dia. Rolls

8' BERTSCH HAND SLIP ROLL: Three

Roll Type, 16 ga. cap. Drop End

No. 353 NIA. INITIAL TYPE SLIP ROLL

FORMER: NEW 1945, 5' 14 ga.

MODEL 0428F PEXTO INITIAL TYPE

SLIP ROLL: 5' 14-16 Ga. Cap.

WELDERS, SPOT

NEW REX WELDERS —

IMMEDIATE DELIVERY

ALL TYPES — ALL SIZES

250 KVA SCIAKY, SPOT, Air Press,

20" throat, 220 volt.

175 KVA THOMSON: 25/4" thr., 440

volts.

100 KVA THOMSON: ELECTRIC: M.D.

Press Type, 12" thr., 440 volt.

100 KVA FEDERAL PROJECTION: Air

Operated, 8" thr., 440 volt.

75 KVA THOMSON ELECTRIC M.D.:

Press Type, 12" thr., 440 volt.

Our "BLUE BOOK" Lists and Illustrates all Types of Metal Working

Machinery.

SEND FOR YOUR FREE COPY TODAY

WRITE — WIRE — or phone YArds 7-5800

Eastern Office — 2829 N. Broad St. — Philadelphia, Penn.

INTERSTATE Machinery Co., Inc.

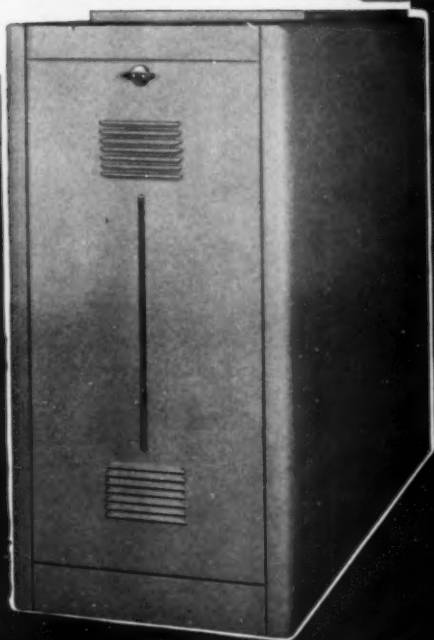
1433 W. PERSHING RD., CHICAGO 9, ILL.

INDEX TO ADVERTISERS

A & A Register Co., The	6	Gallaher Co.	173	Petersen Mfg. Co.	173
A-J Mfg. Co.	157	Galvan Mfg. Co.	179	Philadelphia Rust-Proof Co.	179
A-P Controls Corp.	37	General Electric Co.	159	Pioneer Furnace Co.	184
Acme Electric Welder Co.	172	General Filters, Inc.	142	Pioneer Tool Co.	184
Adams Co., The	174	Gerett Corp., M. A.	172	Potts-Farrington Co.	149
Aerotha Corp.	168	Glassford Corp., The	38	Pratt-Daniel Corp.	149
Air Conditioning Products Co.	133	Gray and Dudley Co.	32	Premier Furnace Co.	178
Air Controls, Inc.	133	Gray Metal Products, Inc.	160	Quiet Automatic Burner Corp.	178
Air Control Prod., Inc.	180	Gustin Bacon Mfg. Co.	41	R C S Tool Sales Corp.	150
Airfan Engng. Co.	126	Hammel Radiator Engrg. Co.	175	Randall Graphite Bearings, Inc.	185
Airtemp Div. of Chrysler Corp.	167	Hall-Neal Furnace Co.	21	Reiner & Campbell Co., Inc.	173
Ajax Furnace Fitting Co.	182	Harrington & King Perforating Co.	138	Reinhard Bros. Co.	155
Alfol Div., Reflectal Corp.	167	Hart & Cooley Mfg. Co.	27	Research Products Corp. Outside Back Cover	107
Allen Co., Inc., L. B.	165	Henderson Furnace & Mfg. Co.	166	Revere Copper & Brass, Inc.	107
Allmetal Screw Products Co.	167	Henry Furnace Co., The	27	Reynolds Metals Co.	55
Alton Mfg. Co.	36	Hess Co., The	147	Richmond Radiator Co.	147
Aluminum Co. of America	173	Hess-Snyder Corp.	177	Rock Island Register Co.	177
American Air Filter Co., The	18	Hussey & Co., C. G.	146	Royal Heaters, Inc.	166
American Brass Co.	18	Illinois Testing Laboratories, Inc.	129	Russell, Burdiall & Ward Bolt and Nut Co.	56
American Gas Machine Co.	169	Independent Pneumatic Tool Co.	52	Rybolt Heater Co.	56
American Machine Products	183	Independent Register Co.	130	Ryerson & Son, Inc., Joseph T.	178
American Radiator & Standard Sanitary Corp.	48	Ingersoll Products Div., Borg-Warner Corp.	131	Sall Mountain Co.	108
American Steel & Wire Co.	40	Inland Steel Products Co.	183	San Angelo Fdry. & Machine Co.	107
Anchor Div., Reflectal Corp.	152	International Nickel Co., Inc.	131	Schaefer Brass Mfg. Co.	158
Anchor Post Products, Inc.	146	Interstate Machinery Co.	176	Schwitzer-Cummins Co.	133
Anemostat Corp. of America	92	Iron Fireman Mfg. Co.	176	Scully Signal Co.	158
Anthracite Institute	135	Iron-Hide Refractories Inc.	150	Security Mfg. Co.	171
Armco Steel Corp.	173	Jackson & Church Co.	177	Sequoia Mfg. Co.	161
Armstrong Co., The	173	John-Manville Corp.	177	Servel, Inc.	179
Armstrong Furnace Co.	146	Johnson & T.	177	Severson Mfg. & Supply Co.	161
Atlas Mfg. Co.	92	Johnson Gas Appliance Co.	177	Siemon & Co.	161
Aur Register Co.	135	Juniper Elbow Co., Inc.	177	Skilvax, Inc.	161
Automatic Burner Corp.	173	Kaiser Aluminum & Chemical Corp.	177	Skuttle Mfg. Co.	161
Automatic Humidifier Co.	173	Kalamazoo Stove & Furnace Co., The	177	Smith, R. E.	163
Bacharach Industrial Instrument Co.	174	Kent Company, Inc., The	177	Standard Stamping & Perforating Co.	163
Barber Colman Co.	172	Kington-Conley Div. Hoover Co., The	177	Stefco Steel Co.	163
Barber Gas Burner Co., The	183	Kirk & Blum Mfg. Co.	3	Stewart-Warner	163
Bayley Blower Co.	168	Ko-Z-Aire, Inc.	180	Sturtevant Co., B. F., Div. of Westinghouse Elec.	163
Berger Bros. Co., Div. of Republic Steel Corp.	128	Krauser-Boyd, Inc.	22	Sundstrand Engrg. Co.	163
Bethlehem Steel Co.	168	Kresno-Stamm Mfg. Co. (America) Inc.	169	Sundstrand Hydraulic Div. Sundstrand	163
Beverly Steel Co.	173	Krauser Seng Gauge Co.	13	Machine Tool Co.	156
Bishop & Babcock Mfg. Co., Inc.	181	Lau Blower Co.	176	Sun-Ray Burner Mfg. Co.	163
Boston Machine Works Co.	169	Levon, David	169	Super Products Co.	163
Brauer Supply Mfg. Co., A. G.	127	Lima Register Company	34	Surface Combustion Corp.	183
Bremil Mfg. Co.	185	Little Giant Vaporizer Co.	171	Swirling Oil Burner Mfg. Co.	26
Brewer Electric Corp.	173	Lockformer Co.	171	Synchromatic Corp.	163
Bristol Metal Working Equip.	127	Made-Rite Co., Inc.	171	Thatcher Furnace Co.	183
Brundage Co.	173	Maid-O-Mint, Inc.	171	Thermac Company	183
Bryant Heater	173	Majestic Co.	171	Thor Metal Prod. Co.	183
Burgess Thomas Company	173	Maplewood Machinery Co.	171	Thor Tool & Die Co.	183
Calculator Specialties Co.	173	Marshalltown Mfg. Co.	171	Toridheat Div., Cleveland Steel Products Corp.	7
Central-West Machinery Co., Inc.	173	Master Products Co.	171	Triangle Mfg. Co.	179
Century Electric Co.	173	Mayerflow Air Conditioners, Inc.	171	Trade-Wind Motor Fans, Inc.	179
Century Engineering Corp.	173	McLarty Systems	177	Trindl Products, Ltd.	179
Certified Furnace Co.	173	McLarty Systems	177	Tri-Saw Corporation	179
Champion Furnace Pipe Co.	173	Mercoid Corp., The	177	Turb-O-Tube Furnace, Inc.	164
Char-Gale Mfg. Co.	173	Meyer & Bro. Co., F.	177	Turner Brass Works, The	164
Chelsea Fan & Blower Co., Inc.	173	Meyer Furnace Co.	177	Tuttle & Bailey, Inc.	164
Chevrolet Motor Div., General Motors Corp.	173	Meyer Register Corp.	177	Union Mfg. Co.	179
Cincinnati Elbow Co., The	173	Mid-Continent Metal Products Co.	177	United States Air Conditioning Co.	179
Clarage Fan Co.	173	Mid-States Welder Mfg. Co.	177	U. S. Machine Corp.	179
Clayton & Lambert Mfg. Co.	173	Miller & Doing	177	United States Register Co.	179
Cleveland Humidifier Co.	173	Miller Products Co. C. A.	177	United States Steel Co.	179
Climatemaker Slide Rule Service	173	Milton Equipment Co.	177	United States Steel Supply Co.	179
Cole-Sewell Engrg. Co.	173	Minneapolis-Honeywell Regulator Co.	177	Utility Appliance Corp.	179
Coleman Co., Inc., The	173	Morey, Dan	177	Van Dorn Electric Tool Co., The	179
Combustion Div., The Steel Products Engrg. Co.	173	Morrison Products, Inc.	177	Van Packer Corp.	179
Comfort Products Corp.	173	Morrison Steel Products, Inc.	177	Viking Air Conditioning Corp.	179
Conco Engineering Works	173	Mueller Furnace Co., L. J.	177	Vyke Brake Co.	179
Condensation Engineering Corp.	173	National Engr. & Mfg. Co.	177	Walker Mfg. & Sales Corp.	179
Corlett-Turner Co.	173	National Heater Co.	177	Wallace Co., William	179
Crosair Heater Co., The	173	National Lock Company	177	Walsh Refractories Corp.	179
Crescent Tool Co.	173	National Metal Fabricators	177	Ward Machinery Co.	179
Crise Controls Div., Acro Mfg. Co.	173	Niagara Machine & Tool Works	177	Waterman-Waterbury Co.	179
Dahlstrom Machine Works	173	Norge Heat Div., Borg Warner Corp.	177	Wayne Home Equipment Co., Inc.	179
Delco Appliance Div., General Motors Corp.	173	Norman Products Co.	177	Webster Elec. Co.	179
Defco Products Div., General Motors Corp.	173	Nu-way Corp.	177	Western Engrg. Co.	179
Des Moines Furnace & Stove Repair Co.	173	Obdyke Inc., Benjamin P.	177	Wheeling Corrugating Co.	179
Detroit Lubricator Co.	173	Ohio Valley Hardware & Roofing Co.	177	White Mfg. Co.	179
Diamond Mfg. Co.	173	Oil Heat Institute	177	White-Rodgers Elec. Co.	179
Dickman Co., Ferdinand	173	Olux Co., 174, 176, 178, 180, 181, 182, & 183	177	Whitney Mfg. Co., W. A.	179
Dole Valve Co.	173	Olson Mfg. Co., C. A.	177	Williams Oil-O-Matic Division Eureka	179
Doyle Vacuum Cleaner Co.	173	Olson & Company, Arthur A.	177	Williams Corp.	179
Dravo Corp.	173	Overhead Heaters, Inc.	177	Williamson Heater Co.	179
Dreis & Krump Mfg. Co.	173	Owens-Corning Fiberglas Corp.	177	Wilson & Co., Inc.	179
Dualtron Co., The	173	Packard Elec. Div. General Motors Corp.	177	Wilson, Inc., Grant	179
Electrol Burner Mfg. Co., Inc.	173	Palmer Mfg. Co.	177	Wise Furnace Co.	179
Elgo Shutter & Mfg. Co.	173	Parker-Kalon Corp.	177	Wise & Sons Co., J.	179
Emerson Elec. Mfg. Co.	173	Patten Co., J. V.	177	Wodack Electric Tool Co.	179
Enderle Inc., Ltd., Frank X.	173	Peck, Stow & Wilson Co.	177	Wolff & Co., Benjamin	179
Fairbanks Morse & Co.	173	Perkins Electric Co.	177	Wyssong & Miles Co.	179
Fallingham Mfg. Co.	173	Perless Foundry Co.	177	Youngstown Furnace Co.	179
Federated Metals Division	173	Penn Electric Switch Co.	177	Zeh Co., Inc.	179
Field Control Div., H. D. Conkey & Co.	173	Penn Ventilating Co.	177	Zink Co., John	179
Flagler Mfg. Co., Roy G.	173	Perfection Stove Co.	177		
Follinsbee Steel Corp.	173	Perick Corp.	177		
Forest City Foundries Co., Inc.	173				

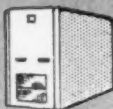
Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

MAYFLOWER for 1951



THERE'S AN **RP**
Air Filter for:

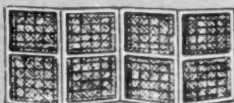
FORCED WARM
AIR FURNACES



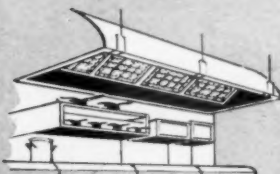
UNIT
AIR CONDITIONERS



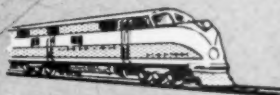
PAINT SPRAY BOOTH



CENTRAL SYSTEM
FILTER BANKS



KITCHEN GREASE CANOPIES



ENGINE INTAKE



SPECIAL
PURPOSE
DESIGNS

*Tell us your
Air Filter
needs and
specifications*

TAKE THAT JUNK
AND DROP IT OFF
AT THE DUMP!



MR. WHITE... DO YOU
REALIZE THAT EVERY
OLD FILTER YOU THROW
AWAY COSTS
YOU 50¢



WHAT DO YOU MEAN
IT COSTS ME 50¢ EVERY
TIME I THROW
AN OLD FILTER
AWAY?



BECAUSE YOU CAN RE-USE
THE FRAME ON AN R-P
FIBER SELF-SEAL AIR
FILTER AND SAVE 50¢ PER
FILTER BY BUYING JUST
THE REPLACEMENT PAD.



YOU REALLY DESERVE
THIS DINNER... THE
"SAVE-THE-FRAME"
SYSTEM SHOWED ME
THE WAY TO FILTER
PROFITS!



WHY DON'T YOU
TRY THE R-P WAY
TO FILTER PROFITS!



Write RESEARCH PRODUCTS CORP., Madison, Wis., U. S. A.

RP

... PRODUCTS OF RESEARCH

WASHABLE AND REPLACEMENT AIR FILTERS • GREASE FILTERS
EVAPORATIVE COOLER MATERIALS